IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

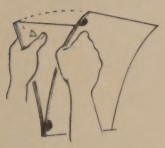
This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

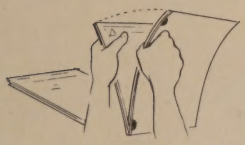


1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.



3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 511 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ DEC. 1960

CONTENTS PHOTOFACT SET 511

TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
MAGNAVOX	
Chassis U34-01-00, U34-02-00, V34-01-00, V34-02-00	511-1
PHILCO	
UJ3702A, F, L, UJ3704BL, GL, PL, J3702A, F, L, J3704BL, GL, PL (Ch. 11N51, 11N51U)	511-2
OTHER EQUIPMENT	
AIRLINE	
GTL-3841A, GTL-3842A (Tape Recorder)	511-3
ARKAY	
CS-28	511-4
AUTOMATIC	
RAP-100, RP-470	511-5
CHANNEL MASTER	
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DP-295	511-7
MAGNAVOX	
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MOTOROLA	
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NORELCO	
B2X98A/70R	511-10
OLYMPIC	
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STROMBERG-CARLSON	
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22-S, 24-S, 1522	511-14
WEBCOR	
1063-1, 1069-1 (Ch. 14X327-1, -2)	511-15
ZENITH	
Royal 780 (Ch. 8CT42, 8CT42Z2)	511-16

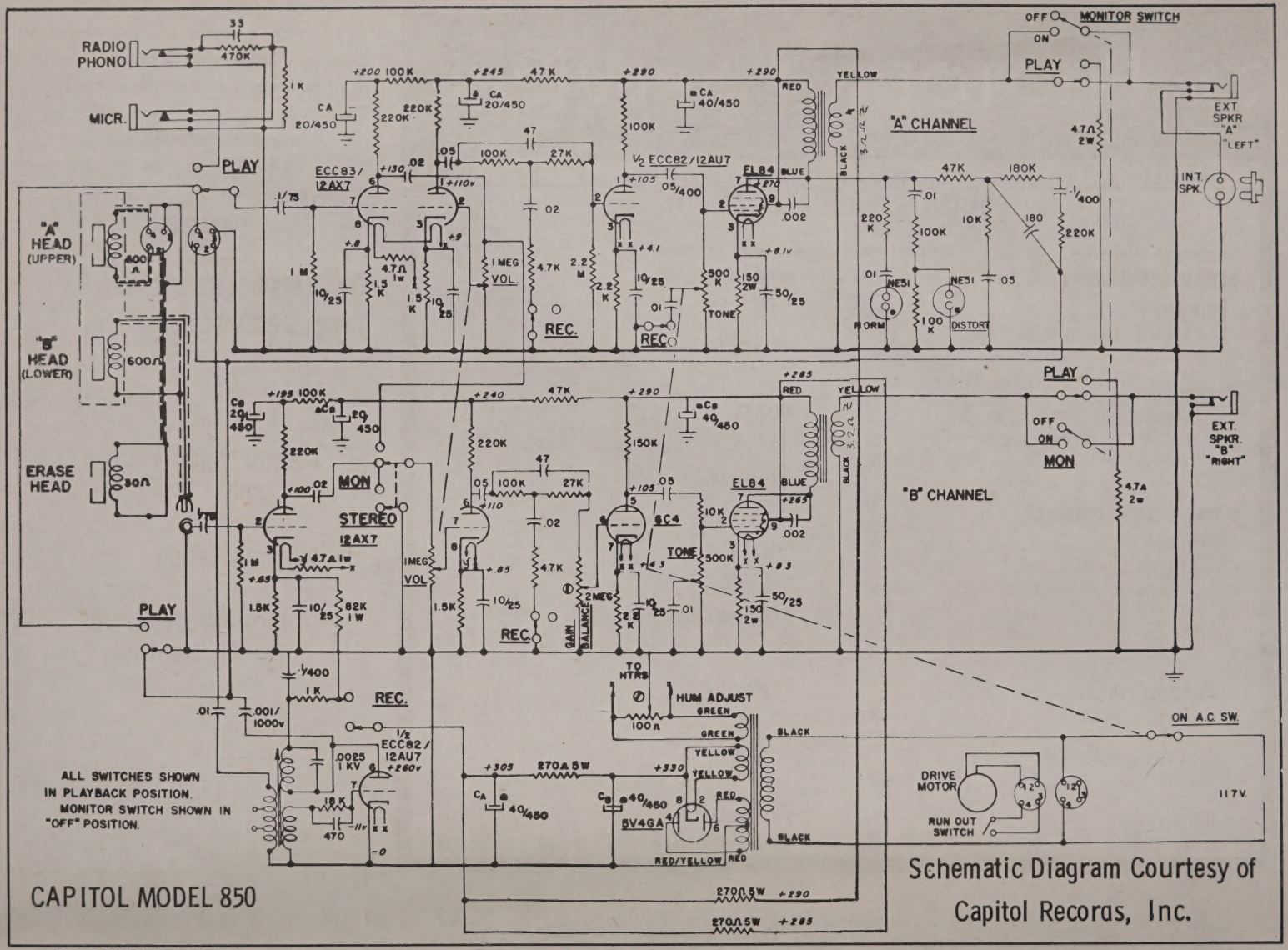
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Capitol Model 850

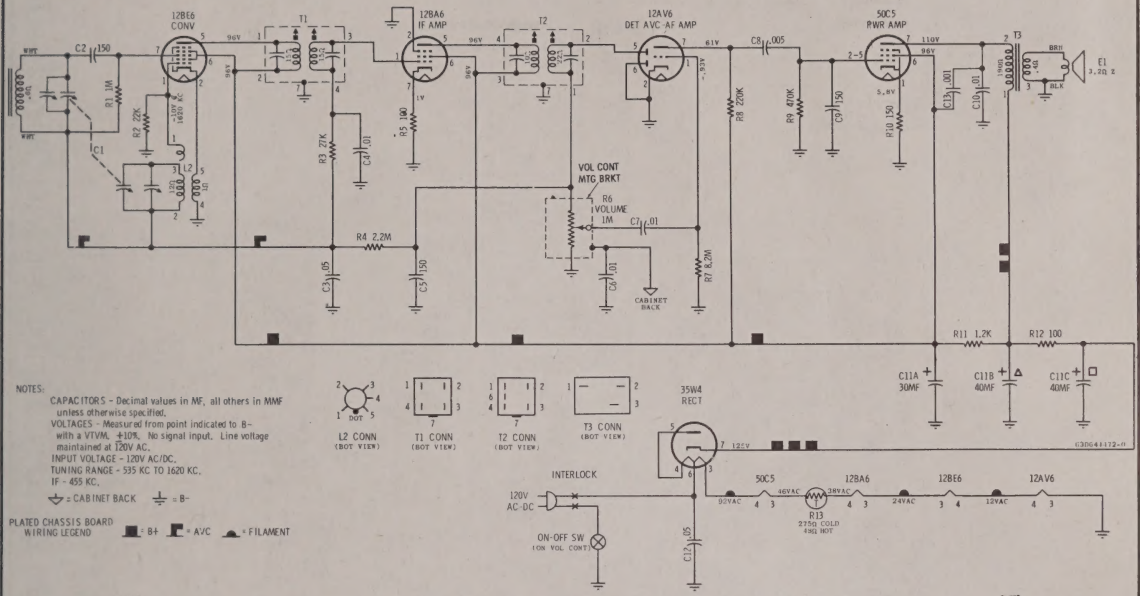
Emud Model 60

Motorola Models A3B, N (CH. HS-746)


RADIO PHONO
MICR.
PLAY
"A" HEAD (UPPER)
"B" HEAD (LOWER)
ERASE HEAD
ECC83/ 12AX7
1/2 ECC82/12AU7
EL84
"A" CHANNEL
"B" CHANNEL
MONITOR SWITCH
OFF
ON
EXT SPKR "A" "LEFT"
INT. SPK.
EXT. SPKR. "B" "RIGHT"
MON
STEREO
12AX7
REC.
TONE
VOL.
BALANCE
HUM ADJUST
TO HTRS
ON A.C. SW.
DRIVE MOTOR
RUN OUT SWITCH
117 V.
ALL SWITCHES SHOWN IN PLAYBACK POSITION.
MONITOR SWITCH SHOWN IN "OFF" POSITION.
CAPITOL MODEL 850
Schematic Diagram Courtesy of Capitol Records, Inc.

STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT					
1.	12BE6 grid (pin 7) thru .1 mf & B-	455 Kc	Fully open	1, 2, 3 & 4	Adjust for maximum.
RF ALIGNMENT					
2.	Radiation loop*	1620 Kc	Fully open	5	Adjust for maximum.
3.	"	1400 Kc	Tune for max	6	"

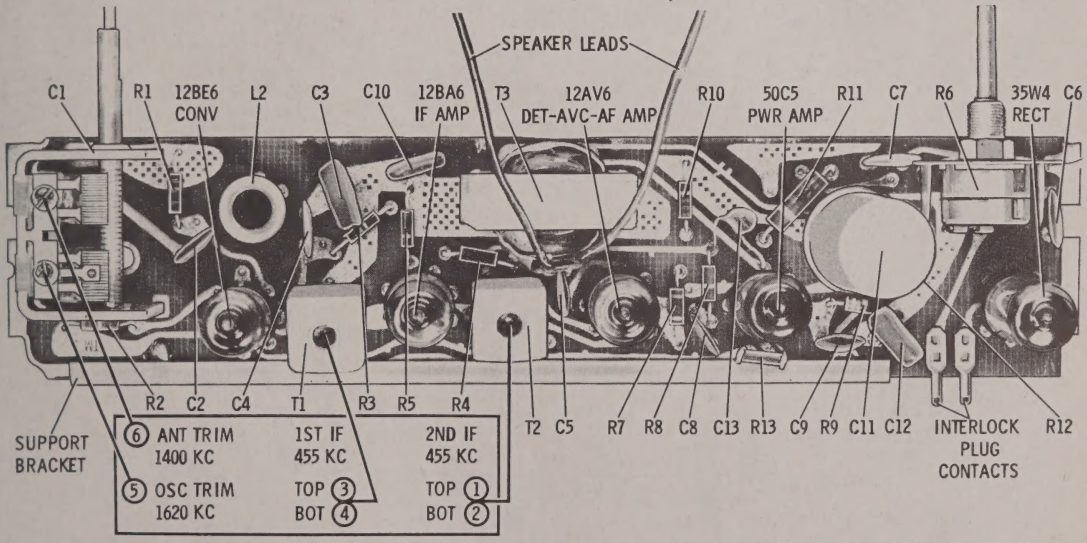
*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep radiation loop at at least 12" from receiver loop.



NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to B- with a VTVM. ±10%. No signal input. Line voltage maintained at 120V AC.
INPUT VOLTAGE - 120V AC/DC.
TUNING RANGE - 535 KC TO 1620 KC.
IF - 455 KC.

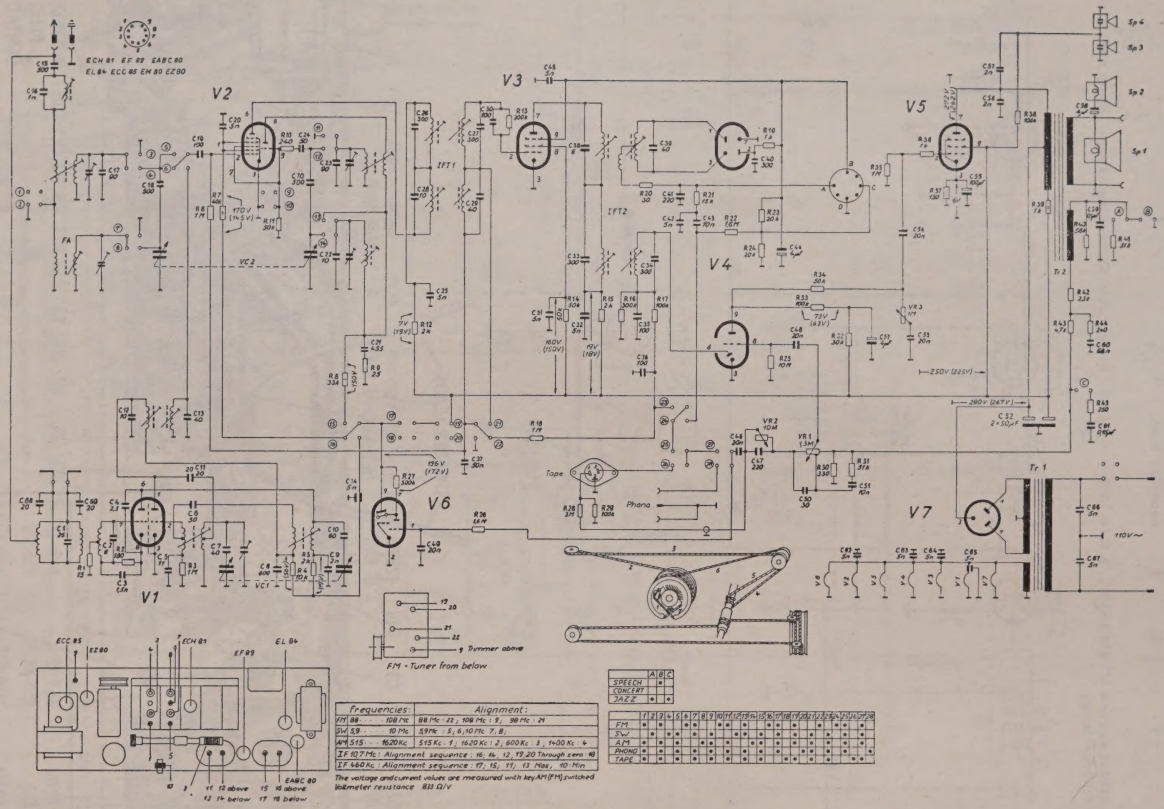
⏚ = CABINET BACK ⏚ = B-

PLATED CHASSIS BOARD WIRING LEGEND = B+ = A/C = FILAMENT



MOTOROLA MODELS A3B, N (CH. HS-746)

Schematic Diagram Courtesy of Motorola Inc.



Frequencies:	Alignment:
FM 88 ... 108 Mc	88 Mc : 22 ; 108 Mc : 9 ; 98 Mc : 24
SW 5.9 ... 10 Mc	5.9 Mc : 5 ; 6 ; 10 Mc 7 ; 8 ;
AM 515 ... 1620 Kc	515 Kc : 1 ; 1620 Kc : 2 ; 600 Kc 3 ; 1400 Kc 4
IF 10.7 Mc : Alignment sequence : 16, 14, 12, 19, 20 Through zero 10	
IF 460 Kc : Alignment sequence : 17, 15, 11, 13 Max, 10 Min	

The voltage and current values are measured with key AM (FM) switched
Voltmeter resistance 833 Ω/V

	A	B	C
SPEECH		•	
CONCERT		•	
JAZZ	•		

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
FM	•			•	•		•			•			•	•			•	•					•			•	•		
SW	•			•	•		•			•			•	•			•	•					•			•	•		
AM	•			•	•		•			•			•	•			•	•					•			•	•		
PHONO	•			•	•		•			•			•	•			•	•					•			•	•		
TAPE	•			•	•		•			•			•	•			•	•					•			•	•		

EMUD MODEL 60

Schematic Diagram Courtesy of Emud: Importer Delmonico International Corp.

PHOTOFACT® Folder with CIRCUITRACE®

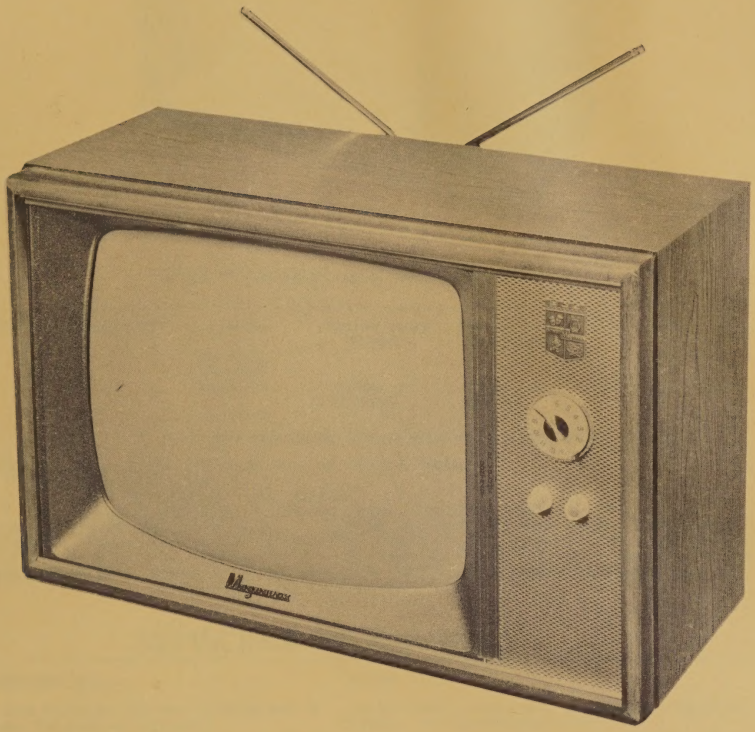
MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00



REPRESENTATIVE MODEL USING CHASSIS V34-01-00

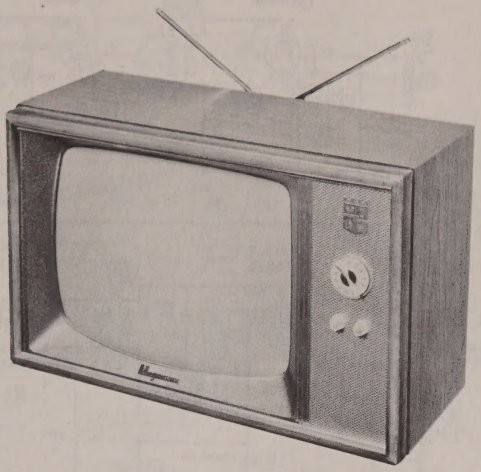
MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00



REPRESENTATIVE MODEL USING CHASSIS V34-01-00

TRADE NAME	MAGNAVOX	TV Chassis	Remote Control Receiver	Remote Control Transmitter	Power Tuning
		U34-01-00			
		U34-02-00			
		* V34-01-00	700835-1 or 7004002-1	700838-1 or 7004003-1	700837-2
		V34-02-00			

*Some models with TV Chassis V34-01-00 do not have Remote Control.

MANUFACTURER	Magnavox Co., 2131 Bueter Road, Ft. Wayne 4, Indiana
TYPE SET	Television Receiver
TUBES	TV: VHF - Eighteen, UHF - Nineteen Remote Control Receiver: 700835-1 - Three 7004002-1 - Five
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING TV (VHF) - 205 Watts, 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

FOR SERVICE INFORMATION ON REMOTE CONTROL RECEIVER 700835-1 AND TRANSMITTER 700838-1 - SEE PHOTOFACT SET 497 FOLDER 1

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 4 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

A 1/4 Amp. S/B fuse is used for horizontal sweep circuit protection. (For location, see "Tube Placement Chart".)

A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis - Bottom View".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning Knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1). (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width Coil. (For location, see "Tube Placement Chart".)

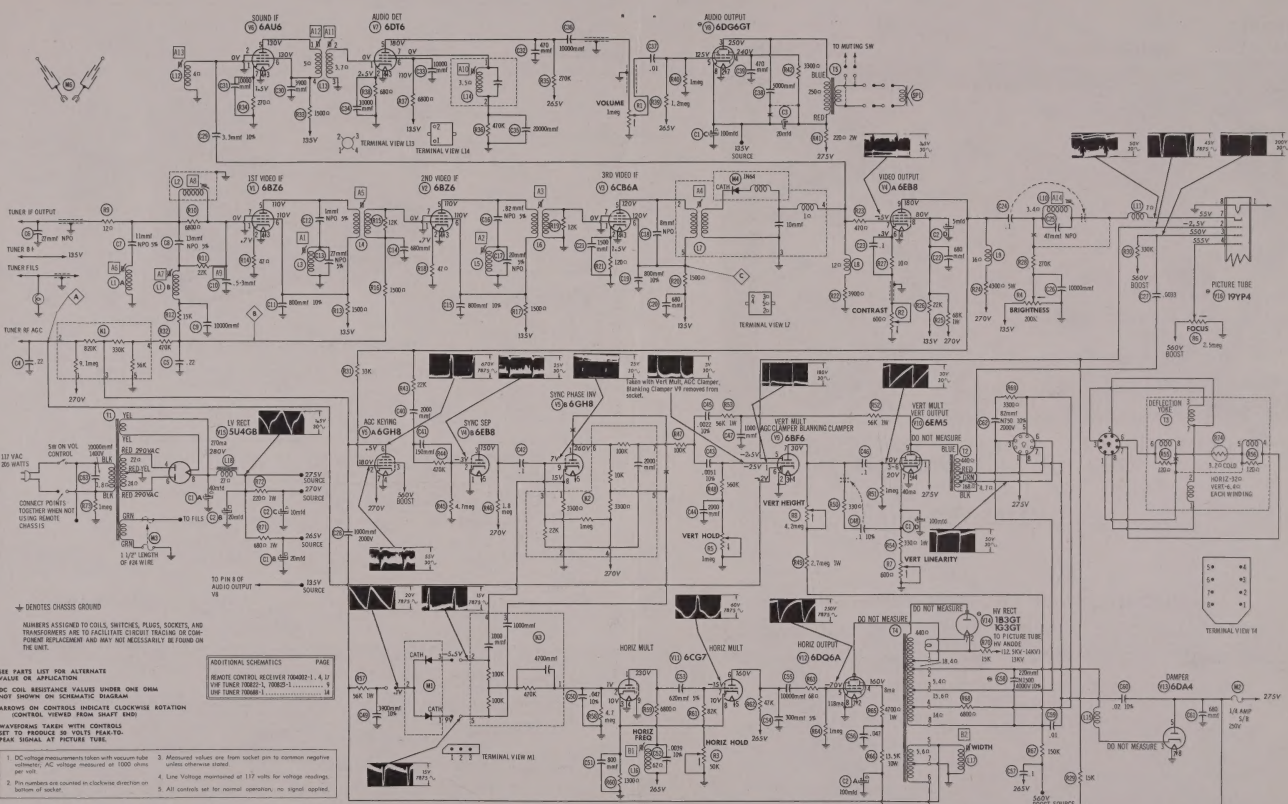
CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

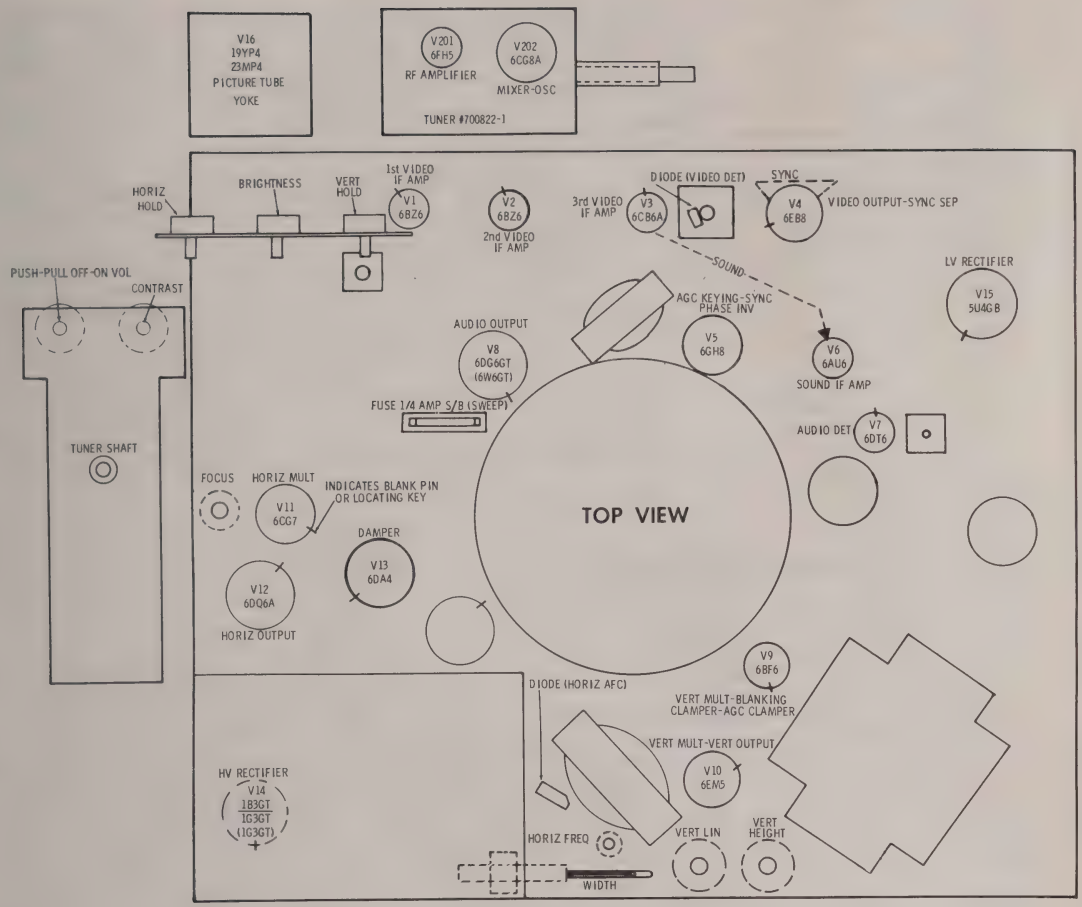
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KA363


SOUND IF V6 6AU6
AUDIO DET V7 6DT6
AUDIO OUTPUT V8 6DG6GT
TO MUTING SW
VOLUME
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6A
VIDEO OUTPUT V4 6EB8
TUNER IF OUTPUT
TUNER B+
TUNER FILS
TUNER RF AGC
CONTRAST
BRIGHTNESS
PICTURE TUBE V16 19YP4
FOCUS
AGC KEYING V9 6GH8
SYNC SEP V8 6EB8
SYNC PHASE INV V5 6GH8
VERT MULT AGC CLAMPED BLANKING CLAMPER V6 6BF6
VERT MULT VERT OUTPUT V10 6EM5
VERT HEIGHT
VERT HOLD
VERT LINEARITY
DEFLECTION YOKE
HORIZ-320 VERT-6,410 EACH WINDING
LV RECT V13 5U4GB
117 VAC 285 WATTS
5in ON VOL CONTROL
CONNECT POINTS TOGETHER WHEN NOT USING REMOTE CHASSIS
TO FILS
TO PIN 8 OF AUDIO OUTPUT V8
HORIZ MULT V11 6CG7
HORIZ MULT V12 6DQ6A
HORIZ FREQ
HORIZ HOLD
HV RECT 1B3GT K3GT V14
TO PICTURE TUBE HV ANODE
DAMPER V13 6DA4
H WIDTH
LIN AMP 5/8 250V
TERMINAL VIEW L13
TERMINAL VIEW L14
TERMINAL VIEW L7
TERMINAL VIEW W1
TERMINAL VIEW T4
DO NOT MEASURE
BLUE
RED
275V SOURCE
270V SOURCE
265V SOURCE
135V SOURCE
560V BOOST
560V BOOST SOURCE
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
ADDITIONAL SCHEMATICS PAGE
REMOTE CONTROL RECEIVER 7004002-1, 4, 17
VHF TUNER 7004012-1, 7008157-1 9
UHF TUNER 7004081-1 14
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1960
MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

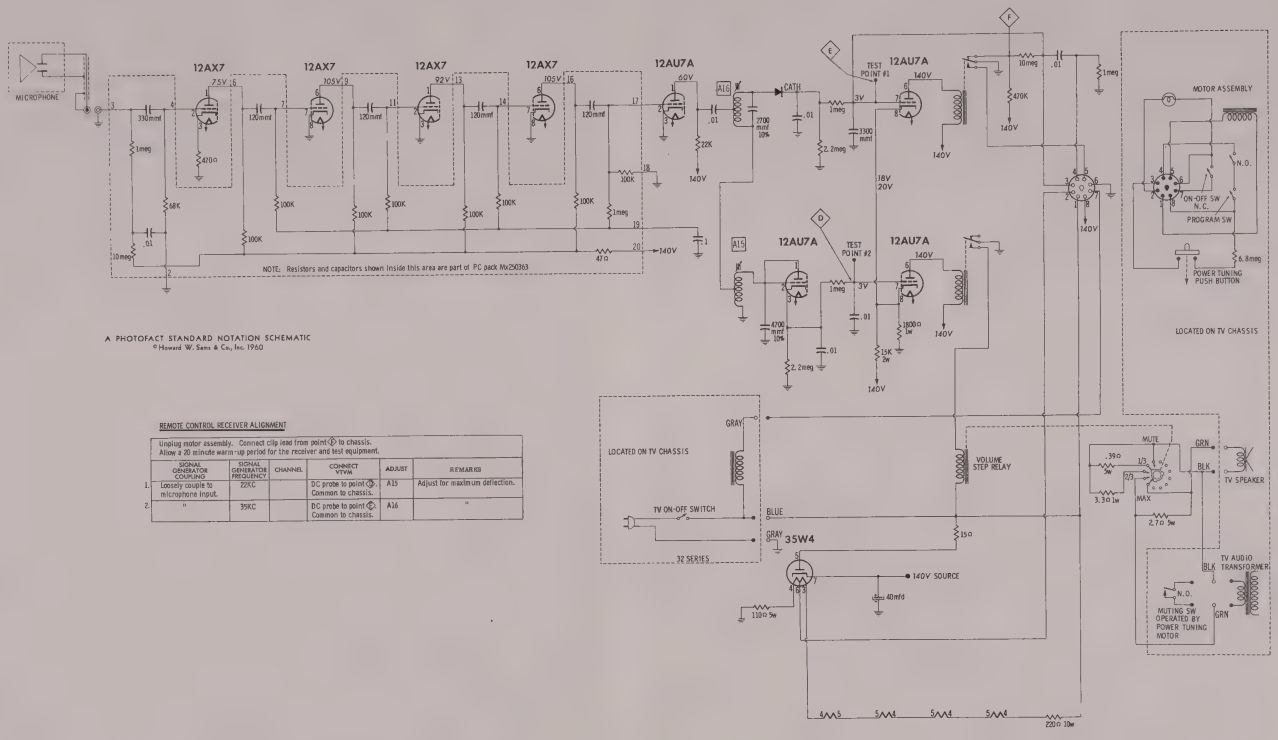
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V15, Fuse Wire (Fil.)

SWEEP FAILURE
No raster, has sound V11, V12, V13, Fuse (Sweep), V14, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9, V10
Horiz. off freq. Diodes (Horiz. AFC), V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.)
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V16
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4, V5
No horiz. sync V4, V5
No vert. or horiz. sync V4, V5



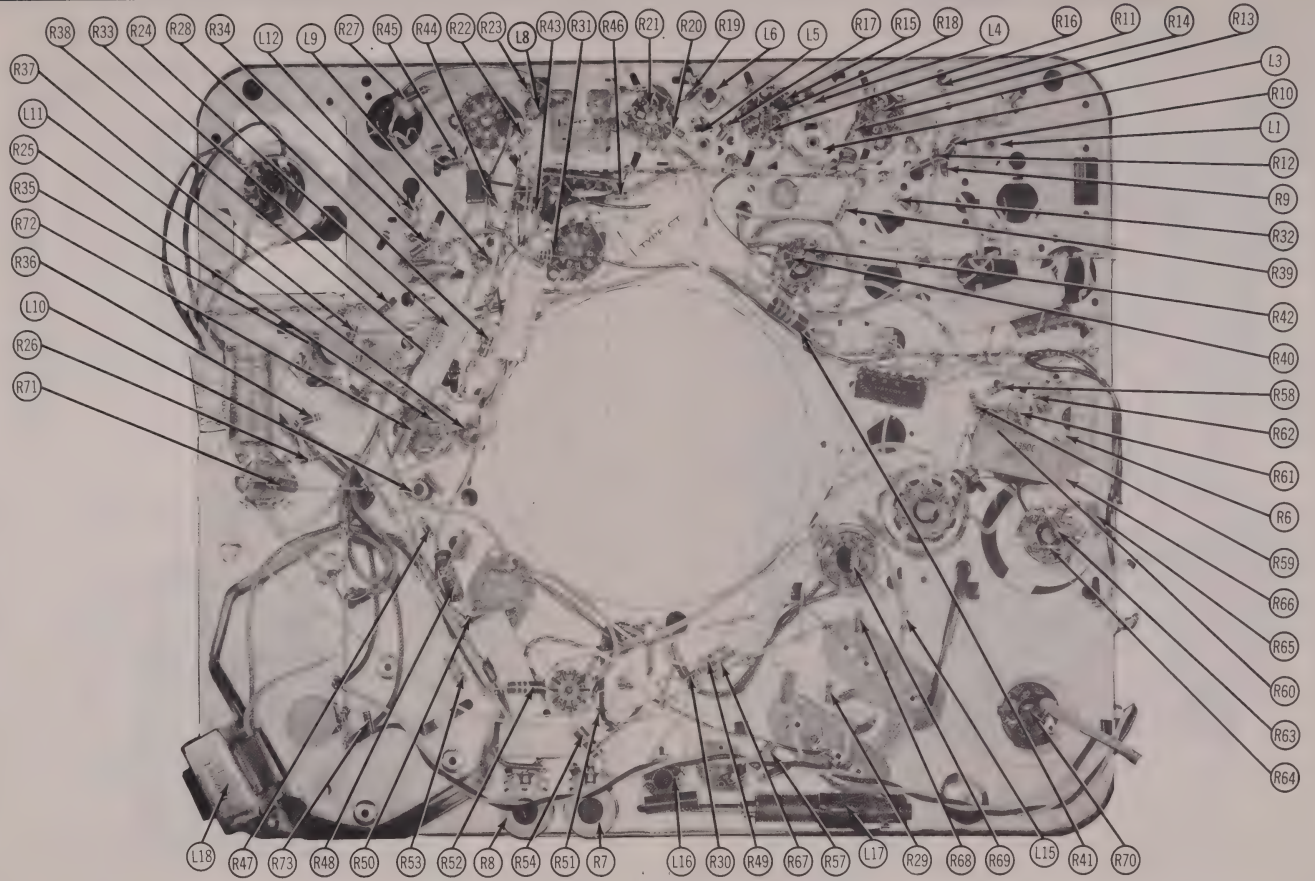
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1960

REMOTE CONTROL RECEIVER ALIGNMENT

Unplug motor assembly. Connect clip lead from point Ⓕ to chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Loosely couple to microphone input.	22KC		DC probe to point Ⓓ. Common to chassis.	A15	Adjust for maximum deflection.
2.	"	35KC		DC probe to point Ⓔ. Common to chassis.	A16	"

REMOTE CONTROL RECEIVER 7004002-1



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1, A2, A4 thru A8 .... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A3, A10 thru A14 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volts bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 3 volt bias supply to point Ⓑ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Preset Mixer Plate Coil by turning core fully counterclockwise.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 1 (grid) of 1st Video IF Amp. Low side to chassis.	44MC (10MC Swp)	39.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis. (Across Video Det. load)	A1	Adjust to place marker in trap notch as in Fig. 1.
2.	"	"	47.25MC	"	"	A2	"
3.	"	"	42.25MC 45.0MC 45.75MC	"	"	A3, A4, A5	Check for response similar to Fig. 1. If necessary, adjust A3 for maximum gain, A4 to place 45.75MC marker at 50% on high frequency side and A5 to place 42.25MC marker at 50% on other side.
4.	Place a thin insulated, metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2.
5.	"	"	47.25MC	"	"	A7	"
6.	"	"	42.25MC 45.0MC 45.75MC	"	"	A8, A9, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.

SOUND IF ALIGNMENT

Preset A10 fully counterclockwise.
Tune the receiver to a strong local station (preferably with a test pattern and tone signal or music). Adjust A10 just past the point of maximum sound and MINIMUM distortion.
Reduce the signal input by disconnecting the antenna or connecting an adjustable pad across the antenna terminals so that with the volume set near maximum, sound is at a low level. Set the Fine Tuning control to the verge of distortion.
Adjust A11, A12 and A13 for MINIMUM distortion.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and set Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible. Adjust A14 for MINIMUM beat interference.

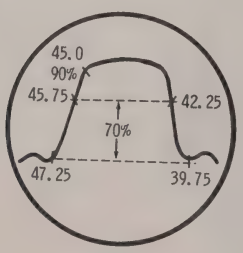


FIG.1

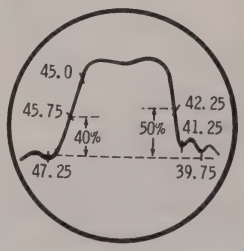
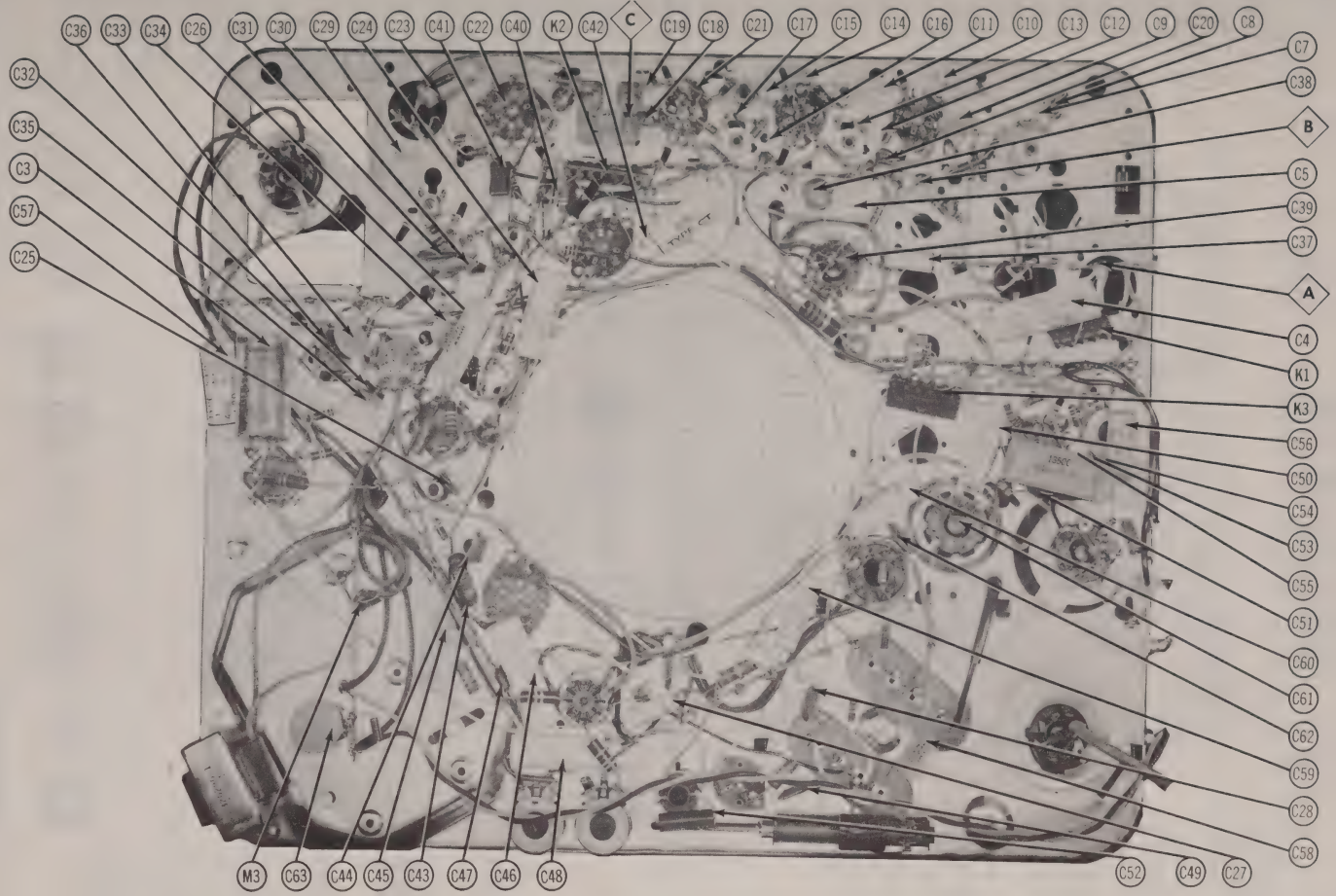
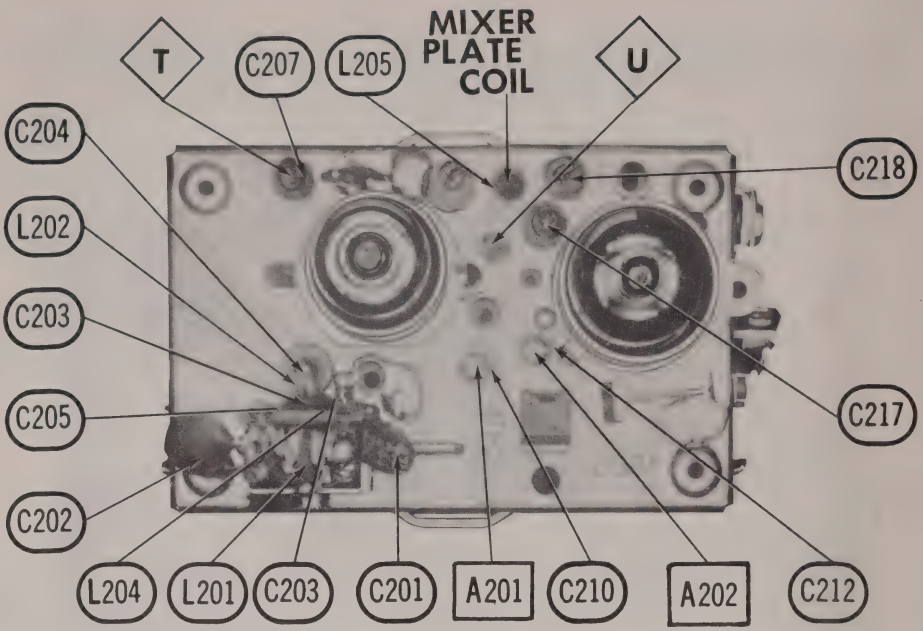


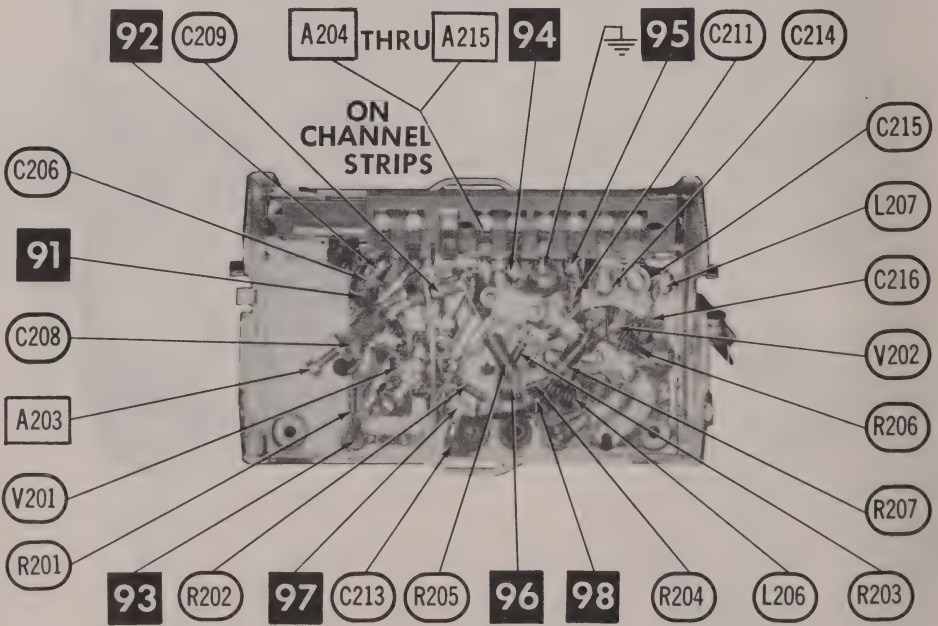
FIG.2



CHASSIS BOTTOM VIEW - CAPACITOR, MISC., & ALIGN. IDENT.



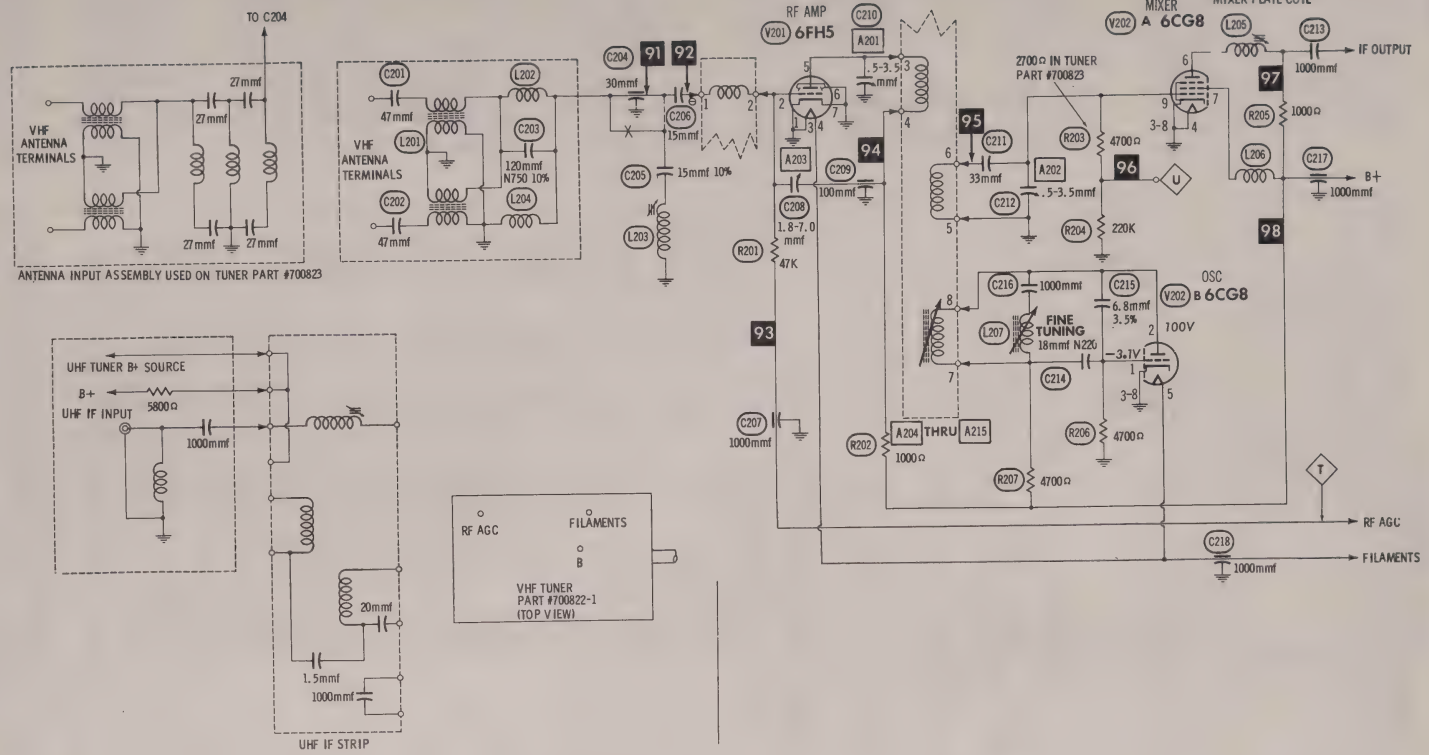
VHF TUNER 700822-1 - TOP VIEW



A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 700822-1 - BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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VHF TUNER 700822-1, 700823-1

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	* GENERAL ELECTRIC * USE	TYPE	ITEM No.	* RAYTHEON * SYLVANIA * USE	TYPE
V1	1st Video IF Amp.	6BZ8	V9	Vert. Mult - Blanking Clamper - AGC Clamper	6BF6
V2	2nd Video IF Amp.	6CB6A	V10	Vert. Mult -	
V3	3rd Video IF Amp.	6CB6A		Vert. Output	5EM5
V4	Video Output - Sync Sep.	6EB8	V11	Horiz. Mult.	6CQ7
V5	AGC Keying - Sync Phase Inv.	6GH8	V12	Horiz. Output	6DQ6A
V6	Sound IF Amp.	6AU6	V13	Damper	6DA4
V7	Audio Det.	6DT6	V14	HV Rectifier	1G3GT/1B3GT (1G3GT) *
V8	Audio Output	6GW6T (6W6GT) *	V15	LV Rectifier	5U4GB

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: MAGNAVOX PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V16	19YP4 / 23MP4			19YP4 ③ / 23MP4 ③	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT.	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	+40	350	27002L-75	AFD4-130-10	DD995	FP432.4	TMQ-4646	TVL8-4606.8 *	
B	+30	350					TD-30-350		
C	+20	200							
D	100	50							
C3A	+100	350	27002L-72	AFD4-07	D0044	FP454.4	TMQ-4310	TVL8-4635.9 *	
B	+30	350							
C	+20	350							
D	5	350							
E	20	350	27003T-20	PRR1736	BR3035	TC85	TD-30-350	TVA-1808	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	HUNTSVILLE PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.33 400V		24SR6-33			CUB4P22	42P-S-334	GEM-4022	47M-P33
C8	.33 400V		24SR6-33			CUB4P22	42P-S-334	GEM-4022	47M-P33
C9	27 NPO		NPO-DI 25	TCZ-27		CUO27C	CCTO-270	CNO-427	10TCC-Q27
C7	11 NPO	5%		TCZ-12		CUO12C	CCTO-120	CNO-412	10TCC-Q12
C3	12 NPO	5%		TCZ-12		CUO12C	CCTO-120	CNO-412	10TCC-Q12
C9	10000		BPD-01	DD-103		BYA10N8	TD-10-350		5HK-B10
C10	.5-3			53S-3			CV-1	CT7S6S	
C11	500	10%	DI-520	DD-501		SR5T8	CD-501	GP3S3	10TS-T50
C13	1	NPO 5%	NPO-SI 1.0	TCZ-1				CNO-510	10TCC-V10
C12	27	NPO 5%	NPO-DO 26	TCZ-27		CUO27C	CCTO-270	CNO-427	10TCC-Q27
C14	680		BPD-00068	DD-681		BYA07T68	CD-681	B-368	10TS-T68
C15	500	10%	BPD-501	DD-501		SR5T8	CD-501	GP3S3	10TS-T50
C16	.33	NPO 5%	Pt. #250088-182						
C17	20	NPO 5%	NPO-DI 20	DTZ-20		CUO20C	CCTO-200	CNO-430	10TCC-Q20
C18	8	NPO	NPO-DI 8.2			CUO8C			10TCC-V82
C19	500	10%	DI-520	DD-501		SR5T8	CD-501	GP3S3	10TS-T50
C20	680		BPD-00068	DD-681		BYA10T68	CD-681	B-368	10TS-T68
C2	1500		BPD-0015	DD-152		BYA10D15	CD-152	B-215	5HK-D15
C23	680		BPD-00068	DD-681		BYA10T68	CD-681	B-368	10TS-T68
C30	.1	200V	24S6N-1	DF-104		CUS2P1	42DP-3-104	GEM-201	47M-P10
C31	.1	600V	24S6N-1	DF-104		CUS4P1	42DP-3-104	GEM-401	47M-P10
C26	47	NPO	NPO-DI 47	DTZ-47		CUQ47C	CCTO-470	CNO-447	10TCC-Q47
C27	10000		BPD-01	DD-103		BYA10I8	CD-103	B-310	5HK-B10
C28	.0033	600V	24S6N-0033	DE-332		CUS6D33	6DP-1-332	GEM-6323	47M-D33
C29	1000	3000V	BYD-30-1000	BPD-102		BYB2I01	6DP-1-102	GEM-6102	47M-P10
C32	3.3	10%	NPO-SI 3.3	TCZ-3R3		CUO3S3C	CCTO-3R3	CNO-3R3	10TCC-Y33
C33	2500		DE-4000	DE-252		LE6Z9	CD-252	GP2Z9	10TS-D39
C35	10000		BPD-01	DD-103		BYA10I8	CD-103	B-310	5HK-B10
C37	470		BPD-00047	DD-471		BYA07T47	CD-471	B-347	10TS-T47
C38	10000		BPD-01	DD-103		BYA10I8	CD-103	B-310	5HK-B10
C39	10000		BPD-01	DD-103		BYA10I8	CD-103	B-310	5HK-B10
C34	10000		BPD-01	DD-103		BYA10I8	CD-103	B-310	5HK-B10
C36	30000		BPD-03	DD-303		BYB5E3	CD-303	B-330	5HK-B30
C40	10000		BPD-01	DD-103		BYA10I8	CD-103	B-310	5HK-B10
C41	.01	400V	24S6N-01	DE-103		CUS4E	42DP-1-103	GEM-411	47M-E10
C42	5000		BPD-005	DD-502		BYA10I5	CD-502	B-315	5HK-D50
C43	470		BPD-00047	DD-471		BYA10T47	CD-471	B-347	10TS-T47
C44	5000		BPD-003	DD-502		BYA10I5	CD-502	B-315	5HK-D50
C41	150		1465-00015	TCZ-150		SW5T15	CM-15B-151M	MC326	UFM-D15
C43	.1	400V	24S6N-1	DF-104		CUS4P1	42DP-3-104	GEM-401	47M-P10
C45	.0051	400V 10%	24S4D5-10%			FM6D5	6DP-1-502	GEM-1635	47M-D50
C46	3000		BPD-012	DD-302		BYA10I2	CD-302	B-320	5HK-D30
C47	.0022	600V 10%	24S6CD22-10%			FM6D22	6DP-1-222	GP2Z2	47M-D22
C48	.1	400V	DF-104			CUS4P1	42DP-3-104	GEM-401	47M-P10
C47	1000		BPD-001	DD-103		BYA07I8	CD-103	B-310	5HK-B10
C48	.01	400V 10%	24S4C4P1-10%			FM4P1	4DP-3-104	GEM-1001	47M-P10
C49	3900	10%	DE-4000			DE-252	CD-392	GP2Z9	10TS-D39
C49	.047	200V 10%	24S4C3S47-10%			FM3S47	4DP-3-473	GEM-1615	27M-S47
C50	1000		BPD-001	DD-90L		L2UD8	D-302	B-302	10TS-T90
C51	.0039	300V 10%	24S6CM-0039			DFM3D39	6DP-1-392	JL-339	10TS-D39
C52	680	5%	1465-00068			DST6S	CM-15B-681J		5HK-B68
C54	300	5%	Pt. #250232-182				VCM-30-300J		
C55	10000		BPD-01	DD-103		BYA10I8	CCD-103	B-310	5HK-B10
C56	.047	400V	24S6N-047	DD-503		CUS4S47	42DP-3-473	GEM-4147	47M-S47
C57	.1	400V	24S6N-1	DF-104		CUS4P1	42DP-3-104	GEM-401	47M-P10
C58	220	400V 10%	Pt. #250175-74						
		Note 1							
C59	.01	600V	24S6N-1		DS-103	CUS6E	6DP-2-103	GEM-611	67M-E10
C60	.02	600V 10%	24S6CS6S-10%			FM6S2	6DP-2-203	GEM-1613	67M-S20
C61	680		BPD-00068	DD-681		BYA10T68	CD-681	B-368	10TS-T68
C62	82	3000V 10%	Pt. #250178-10						
C63	10000	1400V	DAC-37		DDH6-103	SVH10S	16DP-3-103		UAC-310
C64									BL-B10

Note 1. Chassis 24-02 uses 150mmf 4000V 10% in this application (Part #250175-69).

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg		320135-1	BPL-70	C47S-1meg-2	PG23-137(EKT)	PP16A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	Not Req.	Not Req.	Not Req.	Push-Pull Off-On
R2A	500Ω	②	320136-73	B-415	A47-750-B	Q13-106	U9	Contrast
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	50K	②	320148-9	TT-51	B47-50K-B	S11-133	PTA54L	Horiz. Hold
B	Shaft			Not Req.	Not Req.	T7M4	Not Req.	
R4A	300K	②	320146-10	TT-68	B47-300K-B	S11-139	U48	Brightness
B	Shaft			Not Req.	Not Req.	T7M4	Not Req.	
R5A	1meg	②	320146-14	TT-58	B47-1meg-B	S11-137	PTA254L	Vert. Hold
B	Shaft			Not Req.	Not Req.	T7M4	Not Req.	
R6	2.5meg	②	320146-13	TT-56	B47-2.5meg-B	S11-135	PTA55L	Focus
R7A	500Ω	②	320146-13	TT-4	B47-750-B	S11-105	PTA52L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	T7M4	Not Req.	
R8	4.5meg	②	320146-16	TT-66	B47-5meg-B	S11-C5	PTA56L	Vert. Height

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R9	12Ω	
R10	680Ω	
R11	22K	
R12	15K	
R13	1500Ω	
R14	47Ω	
R15	12K	
R16	1500Ω	
R17	1500Ω	
R18	47Ω	
R19	12K	
R20	1500Ω	
R21	120Ω	
R22	3900Ω	
R23	470Ω	
R24	4300Ω 5W	Pt. #340078-53 (IRC #PW5-4300Ω)
R25	68K 1W	
R26	22K 1W	
R27	10Ω	
R28	270K	
R29	15K	
R30	330K	
R31	33K	
R32	470K	
R33	1500Ω	
R34	270Ω	
R35	270K	
R36	470K	
R37	6800Ω	
R38	680Ω	
R39	1.5meg	
R40	1meg	
R41	220Ω 2W	
R42	3300Ω	
R43	22K	
R44	470K	
R45	4.7meg	
R46	1.5meg	
R47	100K	
R48	560K	
R49	2.7meg 1W	
R50	330Ω	
R51	1meg	
R52	56K 1W	
R53	56K 1W	
R54	330Ω 1W	
R55	120Ω	
R56	120Ω	
R57	56K 1W	
R58	4.7meg	
R59	6800Ω	
R60	1800Ω	
R61	82K	
R62	47K	
R63	68Ω	
R64	1meg	
R65	4700Ω 1W	Pt. #340071-35 (IRC #PW10-4300Ω)
R66	12.5Ω 10W	
R67	150K	
R68	6800Ω	
R69	330Ω	
R70	18K	
R71	680Ω 1W	
R72	220Ω 1W	
R73	1meg	
R74	3.3Ω (Cold)	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	Tuner AGC Filter	56K, 330K, 820K, 2.1meg	252043-1	
K2	Sync Phase Inverter Comp.	2500mmf, 3000Ω, 100K, 32K, 100K, 1meg	252045-1	
K3	AFC Comp.	1000mmf, 1000mmf, 4700mmf, 100K, 150K, 470K	252045-1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MAGNAVOX PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1A	41.25MC Trap	320802-1	TV-131	6235	RTC-8526	
B	47.25MC Trap		TV-133	6235	RTC-8556	
L2	1st Video IF	320798-1	TV-131	6235	RTC-8526	
L3	39.75MC Trap	320801-1	TV-132	6235	RTC-8556	
L4	2nd Video IF	320798-1	TV-131	6235	RTC-8526	
L5	47.25MC Trap	320801-1	TV-133	6235	RTC-8556	
L6	3rd Video IF	320798-2	TV-130	6229	RTC-8525	
L7A	4th Video IF	320800-1 ①				① Includes Complete Assembly.
B	RF Choke (Sub)		BC-563	4606	RTC-8517	
C	RF Choke (Sub)		BC-566	4611	RTC-8521	
L8	Peaking (87kh)	320232-18	TV-108	6130	RTC-8579	
L9	Peaking (400ch)	320633-7	TV-202	6136	RTC-8579	
L10	4.5MC Trap	320801-1	TV-133	6235	RTC-8556	
L11	Peaking (320ch)	320632-18	TV-106	6153	RTC-8595	
L12	3rd Sound IF	320722-1	TV-119	1469	RTC-8902	
L13	2nd Sound IF	320715-1	TV-149 a			a Enlarge Mounting Hole.
L14	Ratio Detector Coil	320758-2	TV-124 b	1431 *	RTC-8556 *	b Drill Mounting Hole.
L15	RF Choke (Sub)	320783-1	SW-630	4538	RTC-8525	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MAGNAVOX PART No.	Merit PART No.	Miller PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	Horiz. Stabilizing	320778-2	TV-183	6310	RCU10	RTC-8522	HS-5	WLC-25
L17	Vert. Coil (7-32MH)	320899-1	MVC-12①	6315 ①	QPC504 ②	WC-18 ①	WC-18 ①	WLC-3 ①

① Drill new mounting holes.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 Cy.	REPLACEMENT DATA: MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L18	270A	27Ω	55 Hy	320290-1				C-36X	

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA: MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	PRI. 117V & 1 BA; SEC 1: 580VCT & 270A @ 5V DC; SEC 2: 6.3V & 6A; SEC 3: 5V & 3A; SEC 4; SEC 5	300579-1		P-8388	R-80BA ①		① Parallel & Phase 6.3V Windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MAGNAVOX PART No.	Merit PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	320079-1						
T3	Yoke Horiz. (19MH) (120) Vert. (3.2MH)	300747-5		PCM2017 1 2	DY-57A 1 2	Y-52 1 2	Y-60-1 ①	
	Rear Cover and Centering Device	320804-1						
T4	Horiz. Output	300779-1	HVO-172		HO-335 *		D-183 *	

① Remove Horizontal Damping Network from Yoke. Use original Damping Network, Rear Cover and Centering Device
② Connect Yoke Terminal #2 to Plug #3; Yoke #1 & #3 to Plug #5; Yoke #7 to Plug #8.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

DIRECTIONS	ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	1		1			
	2		2			
	3		3			
	4		4			
	5		5			
	6		6			
	7		7			
	8		8			
	Connect Width Coil Across					
				5 & 7		5 & 7

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4000Ω	3-4Ω	320278-1	A-3018	A-3849	36S60	S-54X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MAGNAVOX PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	580046-1	4A07	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	MAGNAVOX PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	330045-3 *	SG1X *					* Dual Selenium Diode

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MAGNAVOX PART No.	LITTELFUSE PART No.	BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1/4A 250V @ 0°C / 1/2A 250V @ 70°C	180L5T-30	342.250 (2AG 1/4A 250V P/T 8/16	3570D1	MDL 1/4	4405
M3	1 1/2"	length of #24 wire					

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MAGNAVOX PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4	1N54	1N54	1N54	1N54	Video Detector (Pigtail)

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M5	Tuner	700822-1	VHF, STANDARD COIL REPLACEMENT #GG-4220A
	Tuner	700823-1	VHF with UHF Provisions
	Tuner	700688-1	UHF
M6	Antenna	700854-7	JFD REPLACEMENT #TA404

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

700822-1, 700823-1

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6FH5	V202	Mixer - Osc.	6CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C202	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C203	120 N750 10%			TCN-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C204	30	Pt. #250279-1						
C205	15 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C206	15	Note 1	NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7	Pt. #250145-3		829-7				
C209	100		EF-0001	MFT-100				
C210	.5-3.5			829-3		CV-1	CT565	
C211	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C212	.5-3.5			829-3		CV-1	CT565	
C213	1000		DI-1000	DD-102	BYA10DI	CCD-102	GP210	10TS-D10
C214	18 N220	Pt. #250287-1				*		10TCR-Q18
C215	6.8 3.5%		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C216	1000		DI-1000	DD-102	BYA10DI	CCD-102	GP210	10TS-D10
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

Note 1. A 28mmf capacitor (Part #250280-1) is used in Tuner 700823.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	1000Ω	
R203	4700Ω	Note 1

ITEM No.	RATING	REMARKS
R204	220K	
R205	1000Ω	
R206	4700Ω	

ITEM No.	RATING	REMARKS
R207	4700Ω	

Note 1. A 2700Ω resistor is used in Tuner 700823.

COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L201	Ant. Trans.	360813-1	
L202	RF Choke	360740-3	
L203	Trap Coil	360740-4	
L204	RF Choke	360812-1	

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L205	Mixer Plate Coil	360765-2	
L206	RF Choke	360810-1	
L207	Fine Tuning Coil	360811-1	

TUNER ALIGNMENT INSTRUCTIONS
700822-1, 700823-1

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A204 thru A215 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

RF AND MIXER ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point Ⓣ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Turn Contrast fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. to point Ⓤ . Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. Check to see that other channels have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			85MC	83.25MC 87.75MC	6			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

FIG 201

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K across Video Det. load.	A204	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

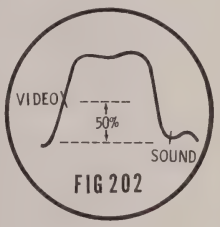
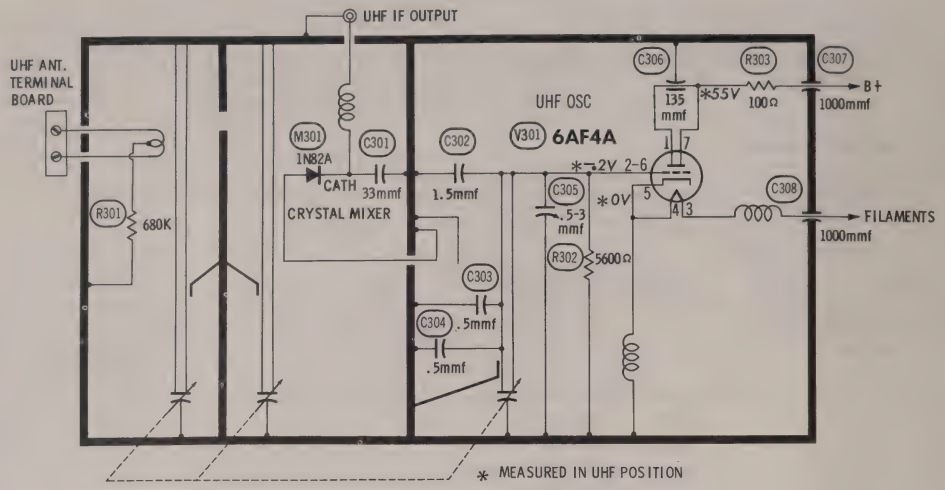


FIG 202

MAGNAVOX CHASSIS U34-01-00, U34-02-00, V34-01-00, V34-02-00

FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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UHF TUNER 700688-1

TUNER PARTS LIST AND DESCRIPTIONS

700688-1

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •		RAYTHEON •	SYLVANIA •	
V301	UHF Osc.	6AF4A			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C301	33			TCZ-33	C10Q33C	CCTO-330	CNO-33	10TCC-Q33
C302	1.5		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C303	.5		NPO-SI. 5	TCZ-R5				
C304	.5		NPO-SI. 5	TCZ-R5				
C305	.5-3			829-3		CV-1	CT565	
C306	135							
C307	1000		EF-001	MFT-1000		CCF-102	CT280A	
C308	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

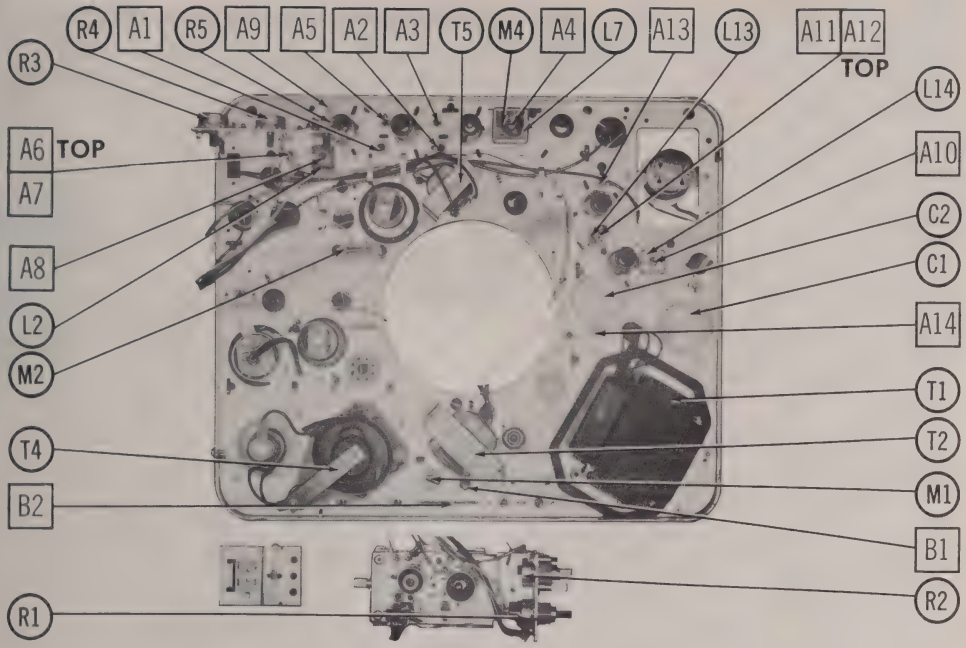
ITEM No.	RATING	REMARKS
R301	680K	

ITEM No.	RATING	REMARKS
R302	5600Ω	

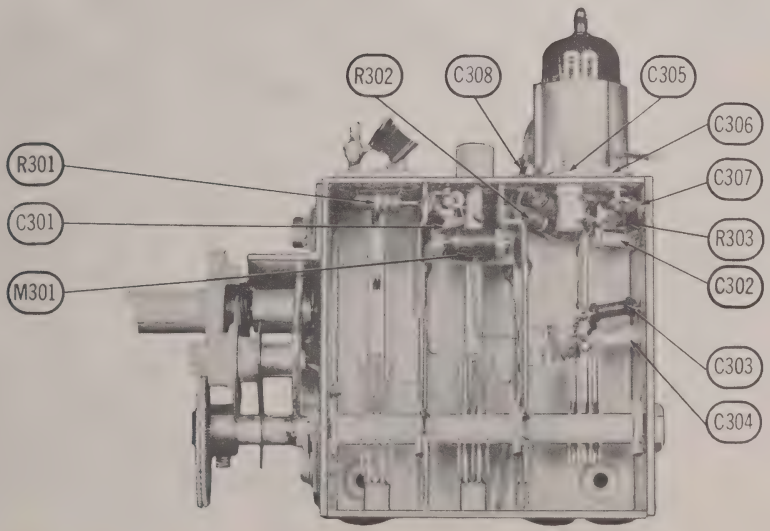
ITEM No.	RATING	REMARKS
R303	100Ω	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M301	1N82A		1N82A	1N82A	UHF Mixer (Clip-in)

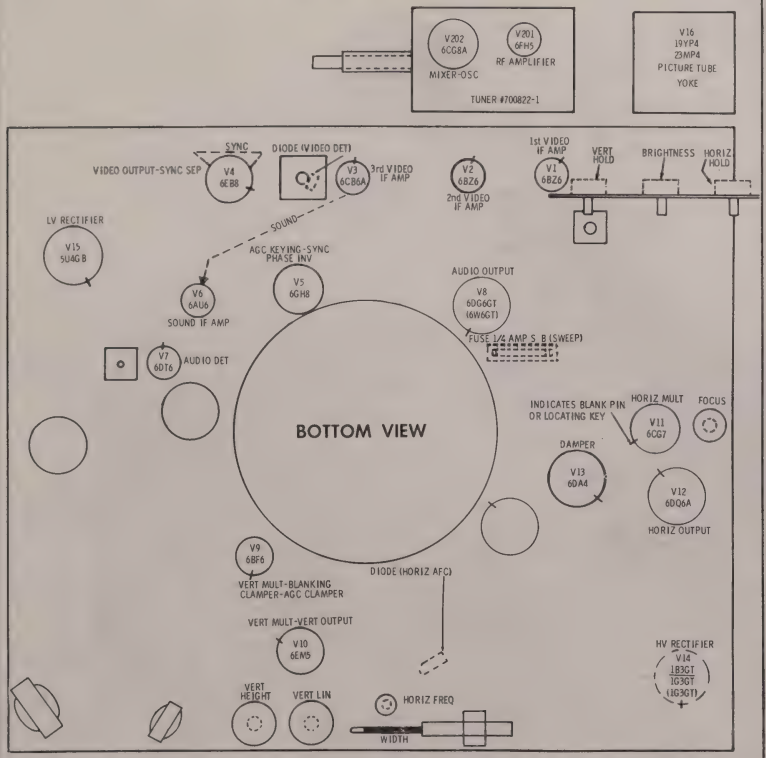


CHASSIS - TOP VIEW



UHF TUNER 700688-1

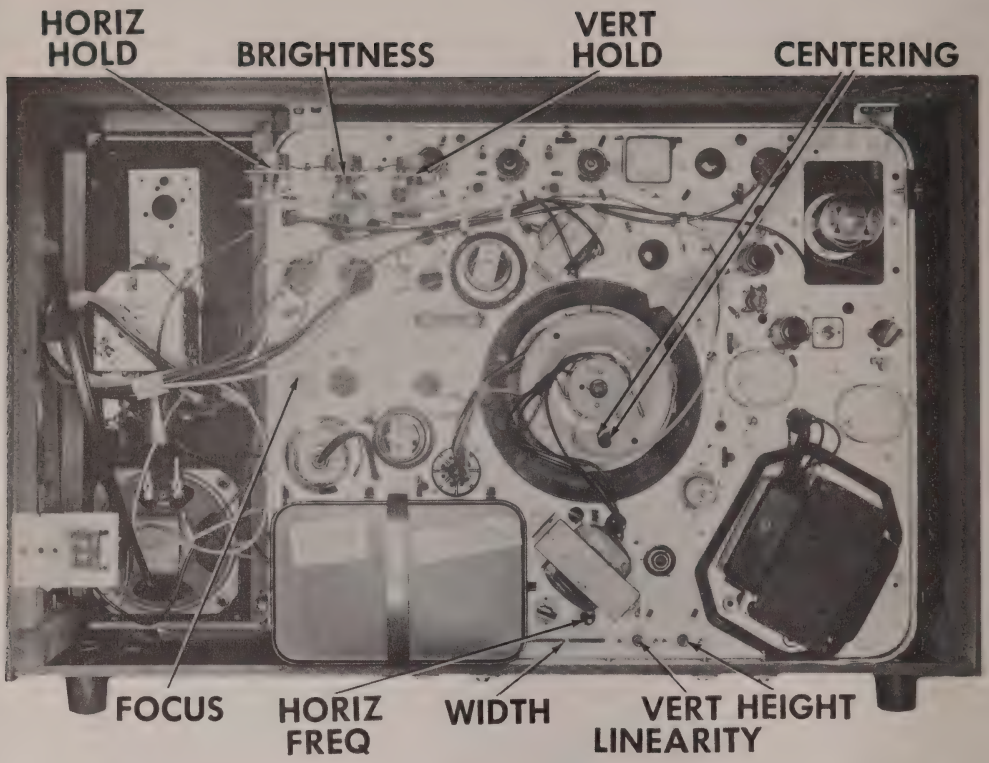
TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	560K	47Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	0Ω		
V2	6BZ6	525K	47Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	0Ω		
V3	6CB6A	.1Ω	120Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	0Ω		
V4	6EB8	0Ω	4.7meg	† 1.8meg	0Ω	.1Ω	● 50Ω	4300Ω	▪ 22K	† 4500Ω
V5	6GH8	† 3500Ω	† 37K	† 150K	0Ω	.1Ω	380K	† 250Ω	3300Ω	22K
V6	6AU6	4Ω	0Ω	.1Ω	0Ω	▪ 1500Ω	▪ 1500Ω	270Ω		
V7	6DT6	3.7Ω	680Ω	.1Ω	0Ω	† 270K	▪ 6800Ω	470K		
V8	6DG6GT	TP	0Ω	† 500Ω	† 3500Ω	500K	NC	.1Ω	¶	
V9	6BF6	● 900K	0Ω	0Ω	.1Ω	15K	1.2meg	● † 5meg		
V10	6EM5	† 27Ω	NC	NC	.1Ω	0Ω	1meg	● 450Ω	NC	† 470Ω
V11	6CG7	† 7500Ω	1.1meg	1300Ω	0Ω	.1Ω	† 47K	● 100K	1300Ω	0Ω
V12	6DQ6A	TP	.1Ω	TP	† 18K	1meg	NC	0Ω	0Ω	TOP CAP † 18Ω
V13	6DA4	NC	NC	¶	NC	† 27Ω	TP	0Ω	.1Ω	
V14	1B3GT 1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP † 460Ω
V15	5U4GB	NC	¶	NC	22Ω	NC	24Ω	NC	¶	
V16	19YP4	.1Ω	15K	† 480K	● † 400K	NC	NC	● 300K	0Ω	
V201	6FH5	0Ω	1.2meg	0Ω	.1Ω	▪ 1000Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	▪ 4700Ω	0Ω	0Ω	.1Ω	▪ 1000Ω	▪ 0Ω	0Ω	225K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 8 OF V15. ▪ MEASURED FROM 135V SOURCE.
‡ MEASURED FROM PIN 3 OF V13. NC NO CONNECTION TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold Control to the center of its range. Adjust the Horizontal Frequency Slug (B1) until the picture synchronizes horizontally. Keep turning B1 in the same direction until the picture just falls out of sync. Reverse the direction of rotation until the picture just falls into sync. Rotate the Horizontal Hold Control to both extreme ends of rotation.

The picture should either stay in sync at both ends of rotation or should fall out of sync by an equal number of bars at each end. If neither of these conditions occur, repeat procedure.

Adjust the Width Slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

PHOTOFACT® Folder with CIRCUITRACE®

**PHILCO CHASSIS
11N51, 11N51U**

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PHILCO CHASSIS
11N51, 11N51U

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MODEL J3702 (CH. 11N51)

SET 511 FOLDER 2

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHILCO CHASSIS
11N51, 11N51U

MODEL J3702 (CH. 11N51)

TRADE NAME	PHILCO	MODEL	CHASSIS
		J3702A, J3702F, J3702L, J3704GL, J3704PL, J3706BL	11N51
		UJ3702A, UJ3702F, UJ3702L, UJ3704GL, UJ3704PL, UJ3706BL ...	11N51U
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pennsylvania		
TYPE SET	Television Receiver		
TUBES	VHF - Sixteen, UHF - Seventeen.		
POWER SUPPLY	108-128 Volts AC, 60 Cycle	RATING	VHF - 160 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

It is necessary to remove the chassis and picture tube for safety glass removal. (See back page for "Chassis and Picture Tube Removal".)

FUSE

A fuse wire is used for filament protection. (For location, see M4 in photo "Chassis-Top View".) ".)

FUSE DEVICE

A 5.6Ω fusible resistor (plug-in type) is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning Knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, See Photo "Main Printed Board", Page 13.)

SYNC STABILITY

Sync stability may be varied by means of a Noise Adjust Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Control (R9A). (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width Control. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PHILCO CHASSIS
11N51, 11N51U

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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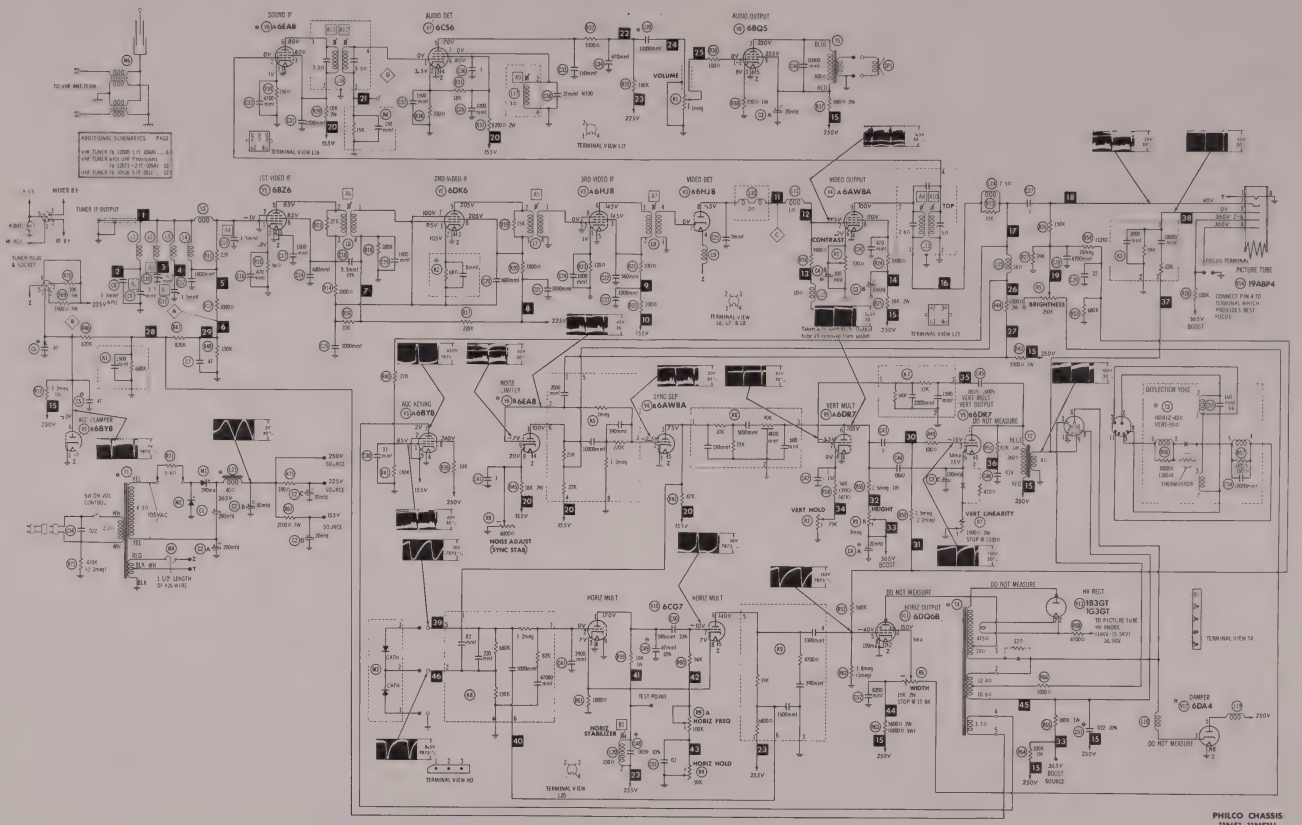
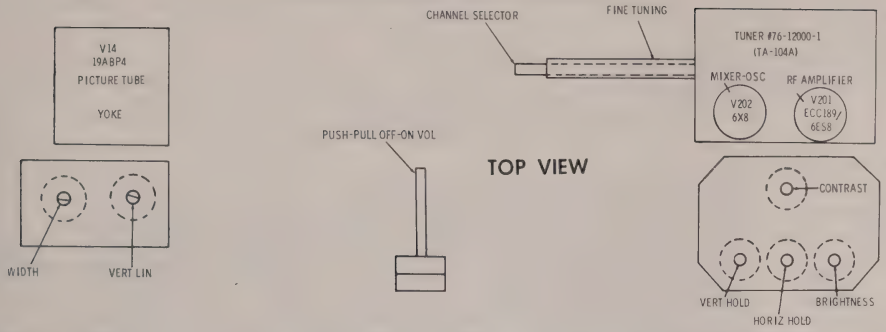
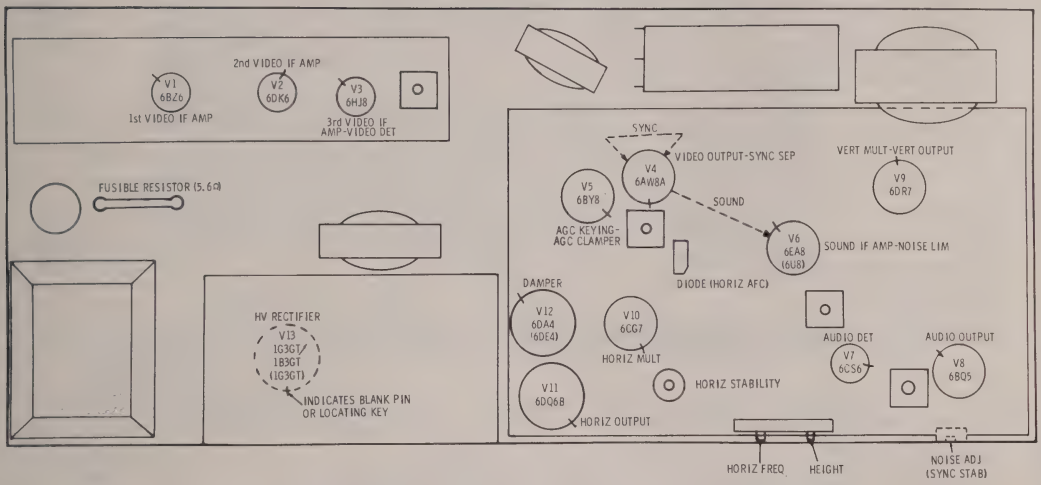

SOUND IF
AUDIO DET
AUDIO OUTPUT
VOLUME
TERMINAL VIEW L17
TO VHF ANTENNA
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 76 170(0-1-T 1(6A)) ... 6
VHF TUNER with UHF (Precision)
76 170(T)-2-T7 (0)(A) 12
UHF TUNER 76 470(0) 5-T7-2(L)) ... 12
TERMINAL VIEW L16
MIXER B+
TUNER IF OUTPUT
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO DET
VIDEO OUTPUT
CONTRAST
TOP
BRIGHTNESS
FOCUS TERMINAL
PICTURE TUBE
19ABP4
CONNECT PIN 4 TO TERMINAL WHICH PROVIDES BEST FOCUS
365V BOOST
TERMINAL VIEW L17
TUNER PLUG & SOCKET
AGC KEYING
NOISE INVERTER
SYNC CLIPPER
VERT MULT
VERT OUTPUT
DO NOT MEASURE
DEFLECTION YOKE
HORIZ-450 Ω
VERT-350 Ω
THERMISTOR
VERT HOLD
HEIGHT
VERT LINEARITY
NOISE ADJUST (SYNC STAB)
HORIZ MULT
HORIZ OUTPUT
HV RECT
TO PICTURE TUBE HV ANODE
TERMINAL VIEW T4
HORIZ STABILIZER
TEST POINT
HORIZ FREQ
HORIZ HOLD
WIDTH
DAMPER
TERMINAL VIEW H3
TERMINAL VIEW L20
ON-OFF VOL CONTROL
105VAC
2 1/2" LENGTH OF A/B WIRE
365V BOOST SOURCE
PHILCO CHASSIS 11N51, 11N51U

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

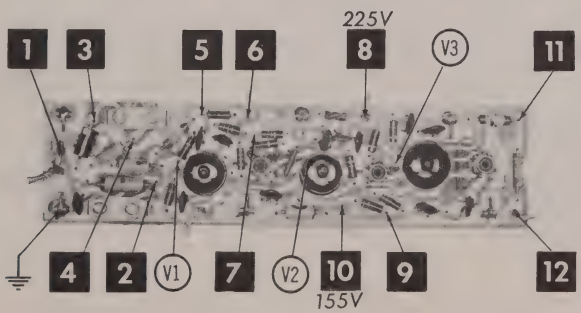
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rectifiers (B+), Fuse Wire (Fil.)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rectifiers (B+)
Vert. off freq. V9
Horiz. off freq. Diodes (Horiz. AFC), V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4
No horiz. sync V4
No vert. or horiz. sync V4



A Howard W. Sams CIRCUITRACE Photo **VIDEO IF PRINTED BOARD**

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

SET 511 FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Set Range switch to "Normal".
Suggested Alignment Tools: Al thru A4 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5 thru Al2, & Mixer Plate.. GENERAL CEMENT #8282, 8606, 8606L, 9295
Coil WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 2.5 volt bias supply to point Ⓑ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	45.85MC (400∿ 30% AM Mod)	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	Mixer Plate Coil	Adjust for maximum 400∿ indication on scope.
2.	"	"	41.25MC	"	"	Al	Adjust for MINIMUM scope indication.
3.	"	"	47.40MC	"	"	A2, A3	Adjust for MINIMUM scope indication. Repeat steps 2 and 3.
4.	"	"	42.7MC	"	"	A4, A5	Adjust for maximum scope indication.
5.	"	"	45.0MC	"	"	A6	"
6.	"	"	44.4MC	"	"	A7	"
7.	Across antenna terminals with 120Ω in each lead.		65.75MC	"	"	Fine Tuning	Adjust Fine Tuning for MINIMUM 400∿ scope indication.
8.	"	69MC (10MC Swp)	67.25MC 70.5MC	4	"		Check for response similar to Fig. 1. If necessary, retouch Mixer Plate Coil to place 67.25MC marker at 50%. Position 70.5MC marker at 50% by retouching A5 and level top of curve with A7. DO NOT retouch A4 and A6.

4.5MC TRAP ALIGNMENT

Use a 4.5MC tuned detector similar to Fig. 2. Before aligning trap, connect detector to an accurate source of 4.5MC signal and adjust the coil slug for maximum DC voltage output.
Set Contrast control fully clockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	High side thru .001mfd to point Ⓒ. Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	DC probe thru detector (Fig. 2) to pin 7 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection on VTVM.

SOUND IF ALIGNMENT

Tune in a strong signal and adjust A9 for maximum sound output. Connect the DC probe of VTVM thru 10K to Ⓓ. Disconnect antenna and adjust Al0, All and Al2 for maximum deflection. If necessary, retouch SLIGHTLY Al0, All or Al2 for MINIMUM noise in sound.

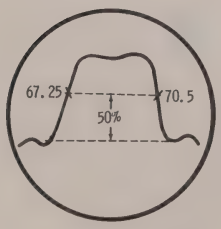


FIG. 1

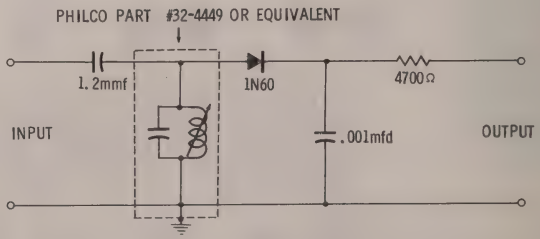
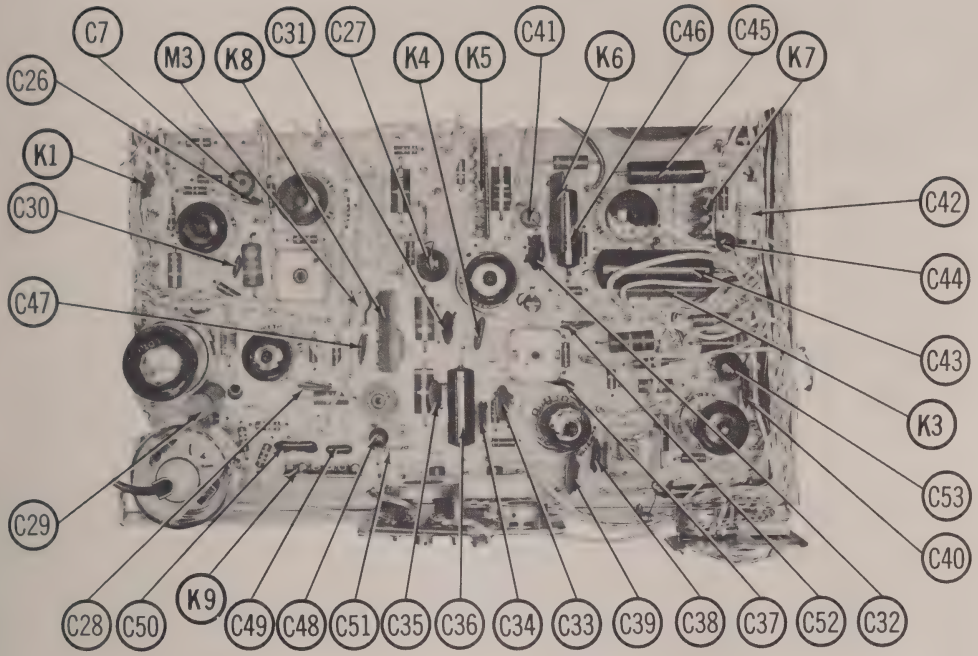
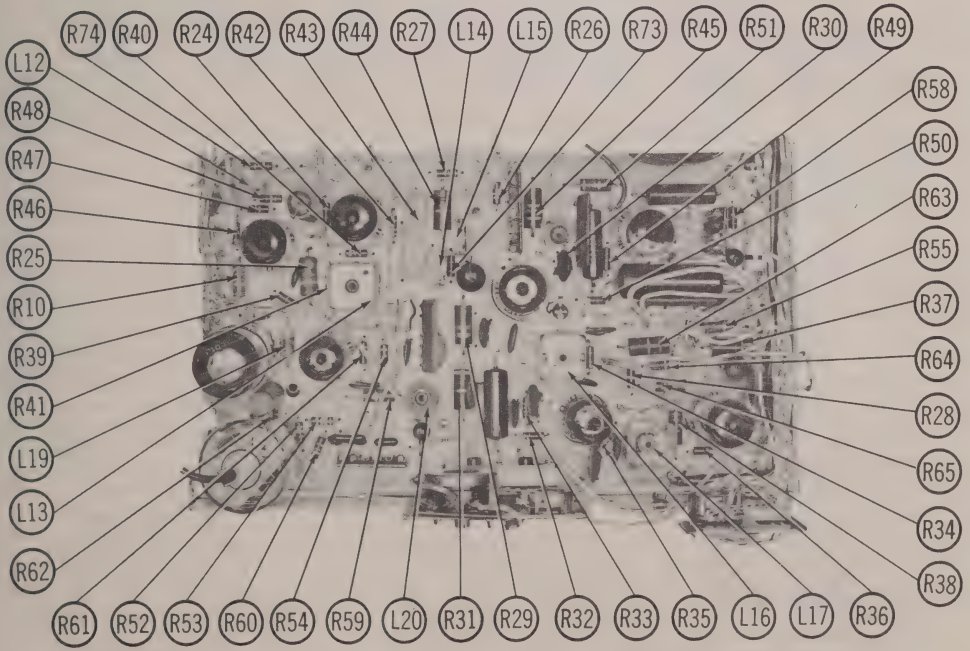


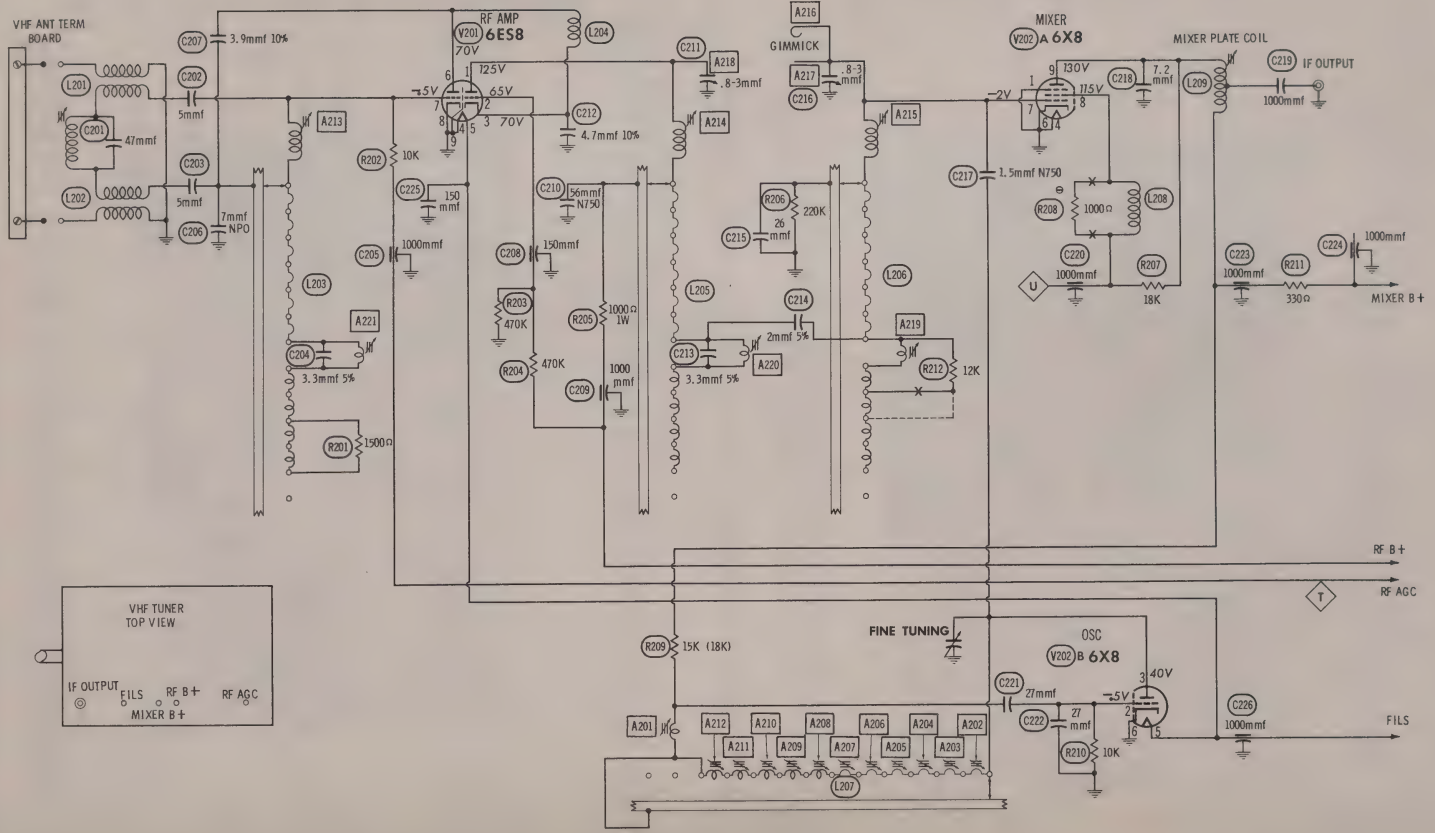
FIG. 2



MAIN PRINTED BOARD - CAPACITOR & MISC. IDENT.



MAIN PRINTED BOARD - RESISTOR & INDUCTOR IDENT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 76-12000-1 (T-104A)

TUNER ALIGNMENT INSTRUCTIONS
T-104A, T-105A, T-28J

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212, A214, A215 ... GENERAL CEMENT #5097, 8727
WALSCO #2515
A217, A218 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A219 thru A221 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range.
This procedure uses the traps of the Video IF Strip. Make certain Video IF Alignment is correct.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Across VHF Antenna Terminals.	209.75MC (400∿ 30% AM Mod.)	13	Across Video Det. Load	A201	Adjust for MINIMUM scope indication.
2.	"	203.75MC	12	"	A202	"
3.	"	197.75MC	11	"	A203	"
4.	"	191.75MC	10	"	A204	"
5.	"	185.75MC	9	"	A205	"
6.	"	179.75MC	8	"	A206	"
7.	"	173.75MC	7	"	A207	"
8.	"	81.75MC	6	"	A208	"
9.	"	75.75MC	5	"	A209	"
10.	"	65.75MC	4	"	A210	"
11.	"	59.75MC	3	"	A211	"
12.	"	53.75MC	2	"	A212	"

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓣ. Positive to chassis.
Detune the Mixer Plate Coil by connecting a 10 or 20mmf capacitor across it.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Across VHF Antenna Terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓘ. Low side to chassis.	A213	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
14.	"	"	"	"	"	A214, A215, A216	Adjust A214 and A215 for symmetrical band-pass. Adjust "Gimmick" (A216) until band-pass coincides with Fig. 201.
15.	"	177MC	174MC 180MC	7	"	A217, A218	Adjust for tilt as shown in Fig. 202. Recheck step 2 and retouch if necessary. Repeat step 3.
16.	"	85MC	85MC	6	"	A219, A220, A221	Turn A219 counterclockwise until a single peak appears. Adjust A220 until peak falls at 85MC. Adjust A221 for maximum gain and symmetry of single peak. Retouch A219 and A220 for symmetrical response centered about 85MC
17.	High side to UHF Input Jack. Low side to chassis	43.5MC		UHF	"	A222	Adjust for flat response.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

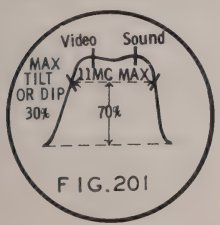


FIG. 201

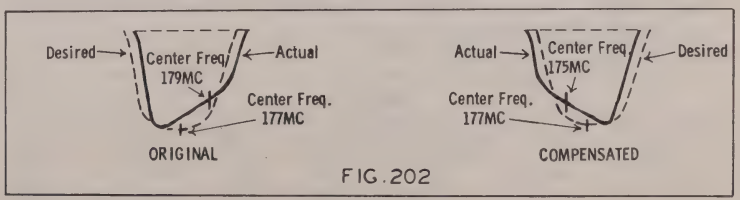


FIG. 202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC * USE	TYPE	RAYTHEON * SYLVANIA * USE	TYPE
V1	1st Video IF Amp.	6BZ8	V7 Audio Det.	6CS6
V2	2nd Video IF Amp.	6BZ8	V8 Audio Output	6BQ5
V3	3rd Video IF Amp.- Video Det.	6BZ8	V9 Vert. Mult.- Vert. Output	6BK7
V4	Video Output - Sync Sep.	6AW8A	V10 Horiz. Mult.	6CQ7
V5	AGC Keying - AGC Clamper	6BT8	V11 Horiz. Output	6DQ6B
V6	Sound IF Amp.- Noise Limiter	6EA8 (6U8) *	V12 Damper	6DA4 (6DE6) *
			V13 HV Rectifier	1G3GT/B3GT (U3GT) *

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: PHILCO PART No	GENERAL ELECTRIC PART No	RCA PART No	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V14	19ABP4					

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: ARROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	300	150	30-3568-TS	AFH3R-3A-24	FM18		TVL8-1431.1 *	
C3A	300	150	30-3690-83	AFH3M-4T-35	FP333.8	TMT-3783	TVL8-4576 *	
B	30	300		D0023	FP333.8	TD-300-150		
C	30	300		BR3015	TC486			
C3A	30	300	30-3803-8	AFH3-113-30	FP390	TMD-3830	TVL-3764	
B	30	150		B0390 BR3006		TD-300-30 *	TVA-3150 *	
C	100	50						
C4A	15	475	30-3617-69	PRB4800	TC83 TC3601		TVAB-3768 *	①
B	100	50						

① Some versions may use 10ufd @ 450V, 100ufd @ 25V (Part #30-3597-7).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: ARROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	FILAMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.47 100V	Note 1	2SS5N-47		CUB2P47	1DP-4-474	1DP-4-474	2TM-2P47
C6	.47 100V	Note 1	2SS6N-47		CUB2P47	1DP-4-474	GEM-2047	2TM-P47
C7	.47 100V		2SS8N-47		CUB2P47	1DP-4-474	GEM-2047	2TM-P47
C9	5.2 MMO		MPO-DE 5.2	DTZ-5S3	C1OY5S2	CCTO-5S3	CNC-5S3	10TCC-Y3
C9	5-8			5S8-3		CY-1	CT5S3	
C10	5-8			8S9-3		CY-1	CT5S5	
C11	1-5			5S8-5		CY-3	CT5S3	
C13	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C13	1-5			5S8-5		CY-5	CT5S5	
C14	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C15	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C16	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C17	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C18	2.2 10%		MPO-SI 3.3	TCZ-5R3	C3OY5C	CCTO-5R3	CNC-5R3	10TCC-Y33
C19	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C20	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C21	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C22	560		DZ-560	DD-561		CCD-561	B-356	10TS-T56
C23	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C24	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C25	5		MPO-DI 5.0	DD-050	L10Y5	CCD-050	GP560	10TS-V50
C26	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C27	.1 400V		2SS6N-1		DF-104	CUB2P1	4DP-3-104	GEM-401 4TM-P10
C28	6800		DAC-68		DF-683	CUB2P68	GEM-3683	BL-D80
C29	.22 100V		2SS8N-22		CUB2P22	1DP-3-224	GEM-3022	2TM-P22
C30	33		DE-33	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C31	2200		BPD-0022	DD-222	BYA10Q22	CCD-222	B-322	5HK-D22
C32	4700		BPD-00047	DD-472	BYA10Q47M	CCD-472	B-347	5HK-D47
C33	150		DI-150	DD-150	L10T15	CCD-151	B-315	10TS-T15
C34	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C35	1000		BPD-001	DD-102	BYA10X	CCD-102	B-310	5HK-I30
C36	100 200V		2SS8N-1	DD-104	CUB2P1	1DP-3-104	GEM-301	2TM-P10
C37	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-I45
C38	27	Pt. 450-1263-47				CCD-153	B-315	10TCB-Q27
C39	10000	Note 3	BPD-01	DD-103	BYA10E	CCD-103	B-310	5HK-E30
C40	10000	(UHF) *	BPD-01	DD-103	BYA10E	CCD-103	B-310	5HK-E30
C41	.1 100V		2SS8N-1		DF-104	CUB2P1	1DP-3-104	GEM-301 2TM-P10
C42	.1 100V	(.1S) *	2SS6N-1		DF-104	CUB2P1	1DP-3-104	GEM-301 2TM-P10
C43	.1 600V		2SS8N-1		DF-104	CUB2P1	1DP-3-104	GEM-301 2TM-P10
C44	.0047 600V		2SS8N-0047		DE-472	CUB2D47	5DP-1-472	GEM-5247 5TM-D47
C45	.0015 1800V		2SS6CN-0015		DDH-152	CUB1D15	1KDP-3-152	GEM-1815 MD-D15
C46	.033 600V		2SS8N-033		DD-523	CUB3D33	4DP-3-333	GEM-4133 6TM-D33
C47	.0022		DC-4000		DD-392	CUB2D22	5DP-3-222	GP239 10TS-D22
C48	.0039 600V 10%	Note 2	V84CD4-10%			DP3S6C39	6DP1-3-392	GEM-1634 6PB-D39
C49	47	Note 4	1495-000047	TCZ-47		2ES2G47	CM-15H-470K	GEM-2447 MB-447
C50	360 10%		1499-00039			SRS739	CM-19S-391K	MCB343 MB-339
C51	.01 100V		2SS8N-01		DD-103	CUB4D1	1DP-1-103	GEM-31 4TM-D10
C52	8200		DAC-28		DD-822	SY816D6	CCD-822	B-282 BL-D82
C53	.022 600V 10%	Note 5	1495E22-10%		DD-203	PM6033	CCD-203	B-303 6TM-S22
C54	10000		BPD-01		DD-103	BYA10E	CCD-103	B-310 5HK-E30
C55	180 5%	(100) *						
C56	.022 600V		2SS6N-022		DD-203	CUB3S22	5DP-3-223	GEM-5223 6TM-S22

Note 1. Some versions may use single 1mfd @ 50V for C5 and C8.
Note 2. Use 4 and later versions use .0033ufd in this application.
Note 3. Run 1, 2, & 3 use .0033mfd @ 600V in this application.
Note 4. Not used in Run 5 and later versions.
Note 5. Run 1 and 2 use .018mfd @ 600V in this application. † Alternate Value.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	long	½	33-5593-54		C478-long-Z	B13-127	PP68A	Volume
B	Shaft				7/8-3/16	EKB	DS-57	
C	Switch				Not Req.	Not Req.	Not Req.	Push-Pull Off-On

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R2A	3300	½	33-5593-43	B-3		B11-103		Contrast
B	Shaft			AK-8		SK9		
R3A	75K	½	33-5593-36	A8-75K-B	A47-75K-S	B11-135	U41	Vert. Hold
B	Shaft			AK-8	R8-3/4	SK9	D8-37	
R4A	50K	½	33-5593-35	A8-50K-B	A47-501K-S	B11-132	TA241	Horiz. Hold
B	Shaft			AK-8	R8-3/4	SK9	D8-37	
R5A	250K	½	33-5593-27	A8-250K-B	A47-251K-S	B11-130	TA2541	Brightness
B	Shaft			AK-8	R8-3/4	SK9	D8-37	
R6A	15K	2(WW)	33-5674-8	WH-153	A42-15K-S	WH-116	W41	Width
B	13 Sh. Reg.			*	*	*	*	
B	Shaft			Not Req.	FSR-1/4	SK9	Not Req.	
R7	1500Ω	2(WW)	33-5591-33		39-1500	113-1500	FL-1.5K	Vert. Linearity
	1225Ω Res.				**	**	#U-14	
R8A	6000Ω	½	33-5593-43	TT-10	B47-6000-S	B11-115	#U-14	Notes Adj. (Sync Stab.)
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R9A	100K	½	33-5593-3					Horiz. Frequency Hold
B	3meg							

* Use 1200Ω Resistor in series with right hand terminal viewed shaft end terminals down.
** Use 1950Ω Resistor in series with right hand terminal viewed shaft end terminals down.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	3.3meg 1W	
R11	22Ω	
R12	1200Ω	
R13	27Ω	
R14	2000Ω	
R15	56Ω	
R16	27Ω	
R17	220K	
R18	180K	
R19	15K	
R20	3300Ω	
R21	330Ω	
R22	120Ω	
R24	3300Ω	
R25	18K 2W	
R26	180K	
R27	39K	
R28	100K	
R29	10K 2W	
R30	1K	
R31	8200Ω 2W	
R33	3300Ω	
R34	330Ω	
R35	100K	
R36	100K	
R37	5600Ω 2W	
R38	330Ω 1W	
R39	10K	
R40	27K	
R41	120K	
R43	47K	
R43	5300Ω 7W	Pt. #3-1336-158 IRC #PW20-53000
R44	1000Ω 2W	
R45	18K 2W	
R46	820K	
R47	820K	
R48	120K	
R49	100K	
R50	1.5meg	(1.2meg) *
R52	100K	
R53	680K	
R54	680K	
R55	1.5meg 1W	(12K) *
R56	100000Ω	(180Ω) †

ITEM No.	RATING	REMARKS
R57	1000Ω	(180Ω) †
R58	56K	(39K) †(47K) *
R59	10K 1W	
R60	56K	
R61	1000Ω	
R62	1.5meg	(1meg) *
R63	56000Ω 2W	(68000Ω) *
R64	100K 1W	
R65	180K 1W	
R66	10000Ω	
R67	27000Ω 7W	Pt. #3-1336-155 IRC #PW10-27000
R69	4700Ω	
R69	33000Ω 5W	Pt. #3-1363-47 IRC #PW5-33000
R70	10K 5W	Pt. #3-1363-48 IRC #PW10-10K3
R71	5.6Ω	Pt. #3-1366-2 IRC #PW5.6Ω (2.2meg) *
R72	470K	
R73	15K	
R74	3900Ω	
R75	390Ω	

* Value used in Run 1 and 2. † Alternate Value
▲ Value used in Run 4 and later versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
E1	AGC Filter	1500mmf, 880K	30-4031-6	
E2	2nd Video IF Cathode	1500mmf, 880Ω	30-4031-5	Note 1
E3	Vert. Retrace	2000mmf, 18000mmf, 22K, 22K	30-4024-4	
E4	2nd IF Secondary Filter	150mmf, 33K	30-4031-4	Sprague PRC-7
E5	Sync Sep. Grid & Plate	240mmf, 2000mmf, 10000mmf, 22K, 22K, 220K, 1meg, 1.5meg	30-4036-1	
E6	Vert. Integrator	150mmf, 800mmf, 6000mmf, 5000mmf, 10K, 33K, 90K	30-4035-8	
E7	Vert. Feedback	1500mmf, 2200mmf, 33K, 68K	30-4033-1	
E8	AFC Comp.	62mmf, 220mmf, 1000mmf, 4700mmf, 82K, 100K, 680K, 1.5meg	30-4035-3	Centralab PC 409 Sprague C-41
E9	Horiz. Mult. Plate	150mmf, 1500mmf, 3300mmf, 4700Ω, 8800Ω, 39K	30-4036-3	

Note 1. Some versions may use individual components in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: PHILCO Part No.	Meiri Part No.	Miller Part No.	Stancor Part No.	NOTES
L2	47.25MC Trap (1.5uh)	32-4645-32	BC-562	4604	RTC-8516	
L3	47.25MC Trap	32-4645-16				
L4	41.25MC Trap (3uh)	32-4645-34				
L5	RF Choke	32-4645-42				
L6	1st Video IF	32-4645-36	TV-189	6175	RTC-8610	
L7	2nd Video IF	32-4645-22				
L7	3rd Video IF	32-4686-2				
L8	4th Video IF	32-4686-3				
L8	Fil. Choke	32-4645-40				
L9	RF Choke (22uh)	32-4674-1	TV-192	6182	RTC-8564	
L10	RF Choke (3uh)	32-4645-7				
L11	Peaking (270uh)	32-4763-9	TV-186	6130	RTC-8576	
L13A	4.5MC Trap 1st Sound IF	32-4688-10				
L14	Peaking (150uh)	32-4762-8	TV-185	6130	RTC-8575	
L15	Peaking (330uh)	32-4763-10	TV-200	6132	RTC-8577	
L16	2nd Sound IF	32-4765-2		6303-PC	RTC-8546	
L17	Quadrature	32-4644-20				
L18	RF Choke (5uh)	32-4623-5	BC-566	4613	RTC-8522	
L19	RF Choke (9uh)	32-4112-82	BC-566	4613	RTC-8522	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: PHILCO Part No.	Meiri Part No.	Miller Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.
L20	Horiz. Stabilizing	32-4754-3				HS-16	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES	INDUCTANCE (@ CURRENT 1000 ~)	REPLACEMENT DATA: PHILCO Part No	Meiri Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No	NOTES
L21	.280A	60Ω	1 Hy.	32-5710-9 ①	C-2296 ①		26C44	C-32Z	

① Drill new mounting holes. ② Alternate Part #32-5710-6.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC 1	SEC 2	REPLACEMENT DATA: PHILCO Part No	Meiri Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No	NOTES
T1	117V @ 1.8A	106V @ 3A AC	6.3V @ 4A Tap @ 2.6A & .450A	32-5902-3 ①					① Alternate Part #32-5902-2 or #32-5902-1.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: PHILCO Part No	Meiri Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.	NOTES
T2	Vert. Output	32-5940-1	2815 L		VO-12	26S75 ①	A-106X	
T3	Yoke (Horiz. 34MH@ 110 ~ (Vert. 39MH@	76-13097-4 ②					Y-72 ③	
	Alt. Yoke	76-13097-1						
	Alt. Yoke	32-9731-4						
	Alt. Yoke	32-9731-1						
	Rear Cover and Centering Device	76-11644-1						
T4	Horiz. Output	32-5951-4						
	Horiz. Output	32-5951-2 ③						

① Use 8 to 1 Turns Ratio. ② Use Yoke Assembly. ③ Use original Yoke Damping Network. Or used in Runs 1 and 2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	REPLACEMENT DATA: PHILCO Part No	Meiri Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.	NOTES
T5	4200Ω	3-4Ω	32-5747-4	A-3036	A-3877	34S45	S-41Z	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: PHILCO Part No	QUAM Part No	NOTES
SP1	3" x 5	PM	3-4Ω	36-3889-1	35A05	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: PHILCO Part No.	GENERAL ELECTRIC Part No.	RCA Part No.	SARKES TARZIAN Part No.	SYLVANIA Part No.	NOTES
M1	.290A	34-8548-2 *		1N1763 *	402 *	SR500 *	* Silicon Type
M2	.290A	34-8549-2 *		1N1763 *	402 *	SR500 *	▲ Dual Selenium, Common Cathode Type
M3		34-8037 ▲	6GC1 *				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: PHILCO Part No. FUSE	PHILCO Part No. HOLDER	LITTELFUSE Part No. FUSE	LITTELFUSE Part No. HOLDER	BUSS Part No. FUSE	BUSS Part No. HOLDER
M4	1½" length of #26 wire		1.34TT					

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO Part No.	NOTES
M5	Tuner	76-13000-1	VHF (T-104A)
	Tuner	76-13013-2	VHF with UHF Provisions (T-105A)
	Tuner	76-13036-1	UHF (T-38J)
M6	Antenna	76-11784-4 *	JFD REPLACEMENT #TA390
	Antenna	76-13264-1 *	JFD REPLACEMENT #TA405

* Models J3702A, F, L, U3702A, F, L. † Models J3704GL, PL, U3704GL, PL, J3706BL.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

MODEL	VHF Channel Selector Knob	UHF Channel Selector Knob	VHF Fine Tuning Knob	UHF Fine Tuning Knob	ON-OFF Volume Knob	Brightness B. - V. Hold Contrast Knob	Safety Glass	Cabinet
J3702A, U3702A	434-R53	434-R67	434-R53	434-R68	434-R65	434-R69	54-5839-1	51-6149-3
J3702F, U3702F	434-R53	434-R67	434-R53	434-R68	434-R65	434-R69	54-5839-1	51-6149-3
J3702L, U3702L	434-R53	434-R67	434-R53	434-R68	434-R65	434-R69	54-5839-1	51-6149-3
J3704GL, U3704GL	434-R70	434-R67	434-R71	434-R68	434-R65	434-R69	54-5839-1	51-6149-6
J3704PL, U3704PL	434-R70	434-R67	434-R71	434-R68	434-R65	434-R69	54-5839-2	51-6149-7
J3706BL, U3706BL	434-R70	434-R67	434-R71	434-R68	434-R65	434-R69	54-5839-3	51-6149-14

PARTS LIST AND DESCRIPTIONS (Continued)

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

T—104A

TUBES

• GENERAL ELECTRIC •			• RAYTHEON •		• SYLVANIA •
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6ES8	V202	Mixer - Osc.	6X8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C202	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C203	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C204	3.3 5%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	7 NPO		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C207	3.9 10%	Pt. #30-1221-14			C10V4C			10TCC-V39
C208	150	Pt. #30-1268-19						
C209	1000		EF-001	MFT-1000		CCF-102	CT280A	
C210	56 N750		N750-DI 56	DTN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56
C211	.8-3.0	Pt. #31-6520-29		829-3		CV-1	CT565	
C212	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C213	3.3 5%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C214	2.0 5%		NPO-SI 2.0	TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C215	26		NPO-DI 25	DTZ-25	C10Q25C	CCTO-270	CNO-425	10TCC-Q25
C216	.8-3.0	Pt. #31-6520-29		829-3		CV-1	CT565	
C217	1.5 N750	Pt. #30-1271-6						
C218	7.2		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C219	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	"
C221	27		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C222	27		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C223	1000		EF-001	MFT-1000		CCF-102	CT280A	
C224	1000		EF-001	MFT-1000		CCF-102	CT280A	
C225	150		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C226	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	1500Ω	
R202	10K	
R203	470K	
R204	470K	

ITEM No.	RATING	REMARKS
R205	1000Ω 1W	
R206	220K	
R207	18K	
R208	1000Ω	Note 1

ITEM No.	RATING	REMARKS
R209	15K	(18K) *
R210	10K	
R211	330Ω	
R212	12K	

* Alternate Value.

Note 1. May not be used in some versions.

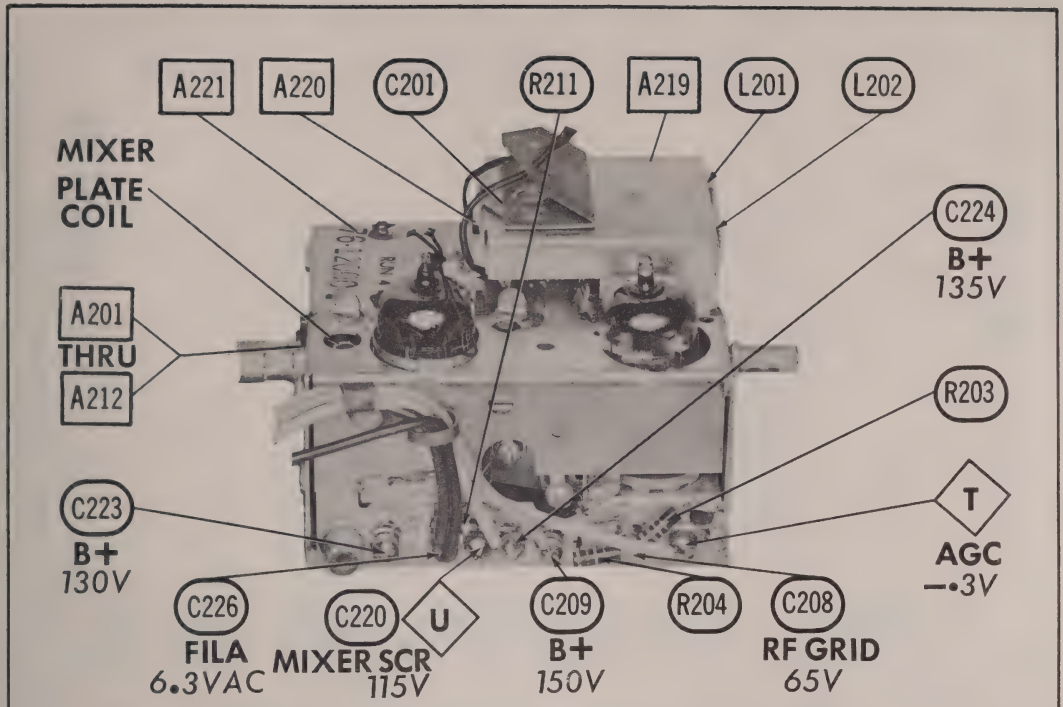
COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES
L201	Ant. Coil	32-4726-6	
L202	Ant. Coil	32-4726-5	
L203	Ant. Coils	318-5539	Channel 2 thru 13 Includes Wafer Assembly
L204	RF Choke	312-80081-15	
L205	RF Coils	318-5540	Channel 2 thru 13 Includes Wafer Assembly

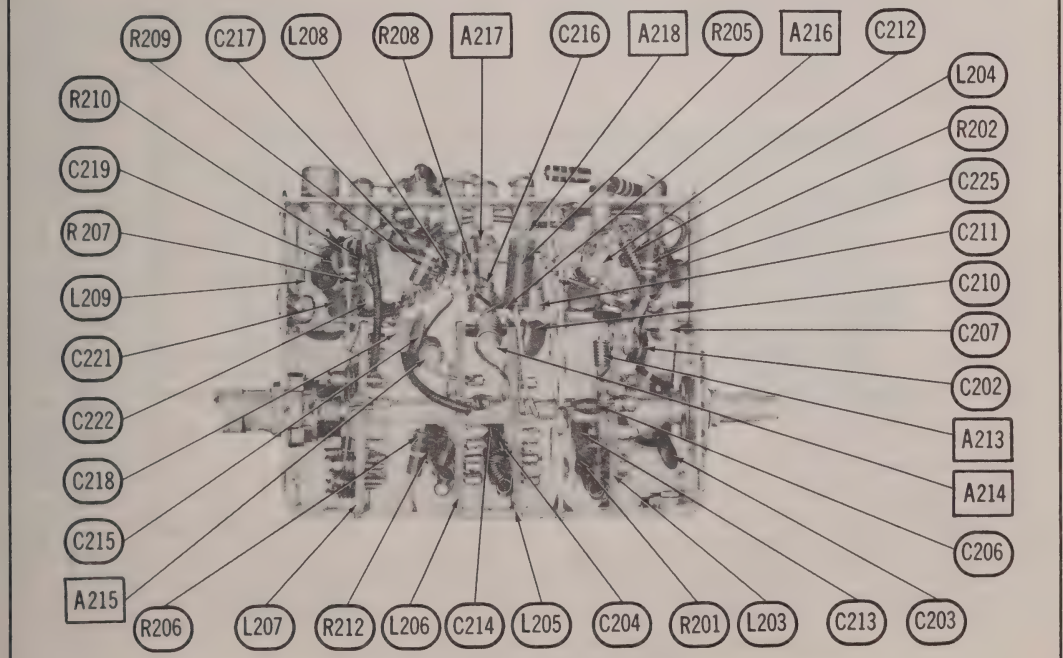
ITEM No.	USE	PHILCO PART No.	NOTES
L206	Mixer Grid Coils	318-5541	Channel 2 thru 13 Includes Wafer Assembly
L207	Osc. Coils	318-5531	Channel 2 thru 13 Includes Wafer Assembly
L208	RF Choke	312-5133-18	
L209	Mixer Plate Coil	32-4629-14	

MISCELLANEOUS

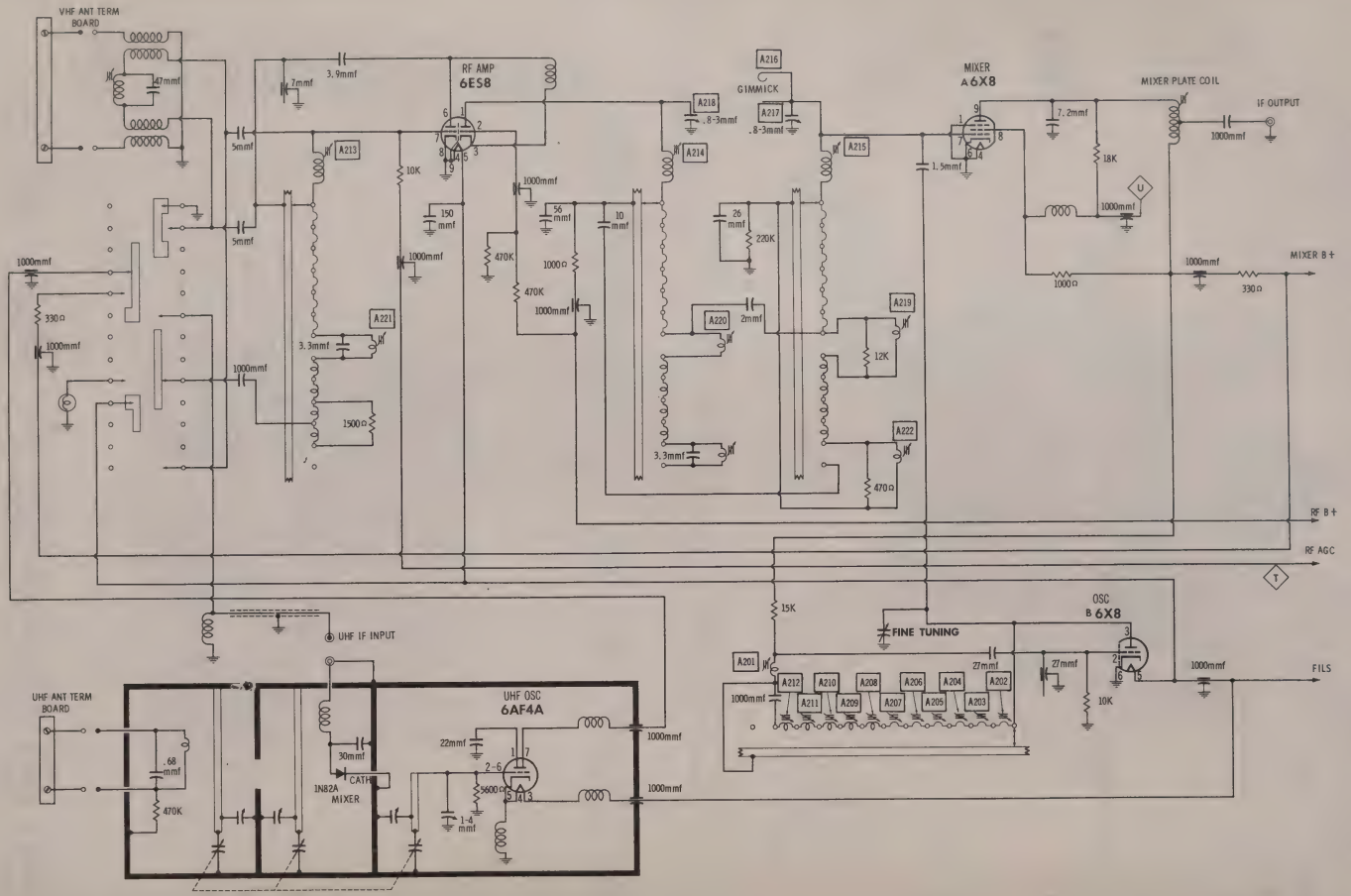
ITEM No.	PART NAME	PHILCO PART No.	NOTES
	Rotor Shaft	28-13348-2 76-12019-1	Fine Tuning



VHF TUNER 76-12000-1 (T-104A) - TOP VIEW



VHF TUNER 76-12000-1 (T-104A) - BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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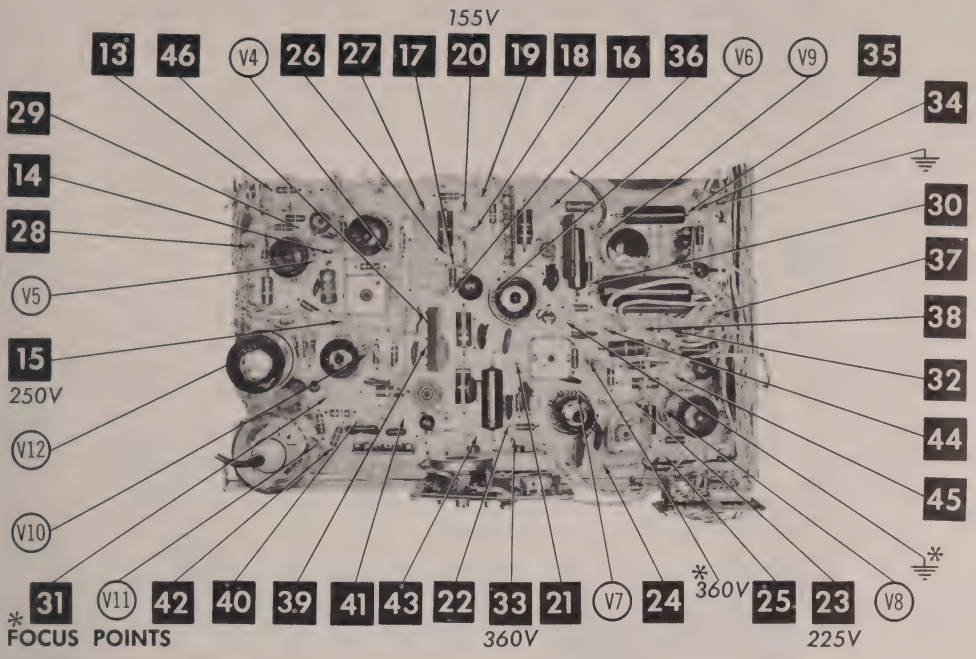
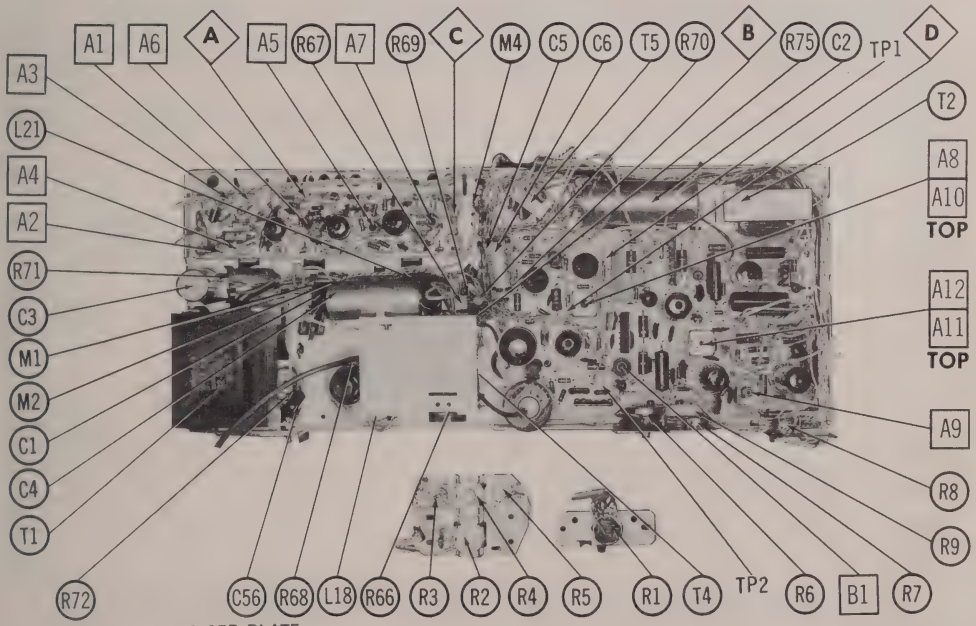
VHF TUNER with UHF Provisions 76-12073-2 (T105A) & UHF TUNER 76-10526-5 (T-28J)



A Howard W. Sams CIRCUITRACE Photo

MAIN PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



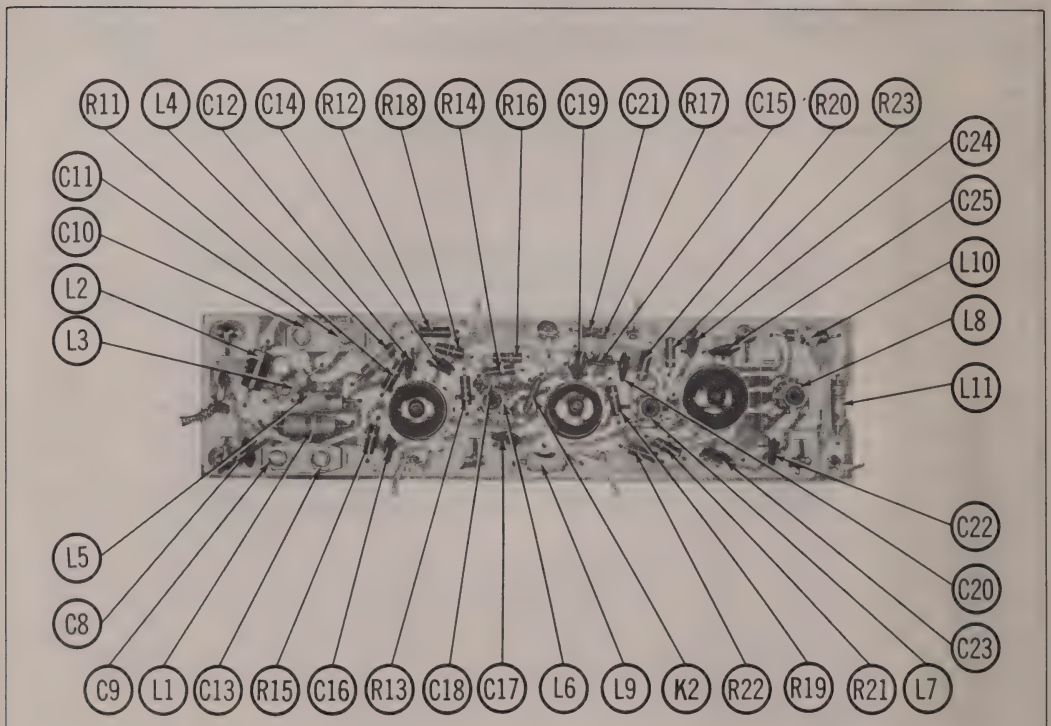
TP1 75V SYNC SEP PLATE
TP2 225V HORIZ MULT PLATE

CHASSIS - TOP VIEW

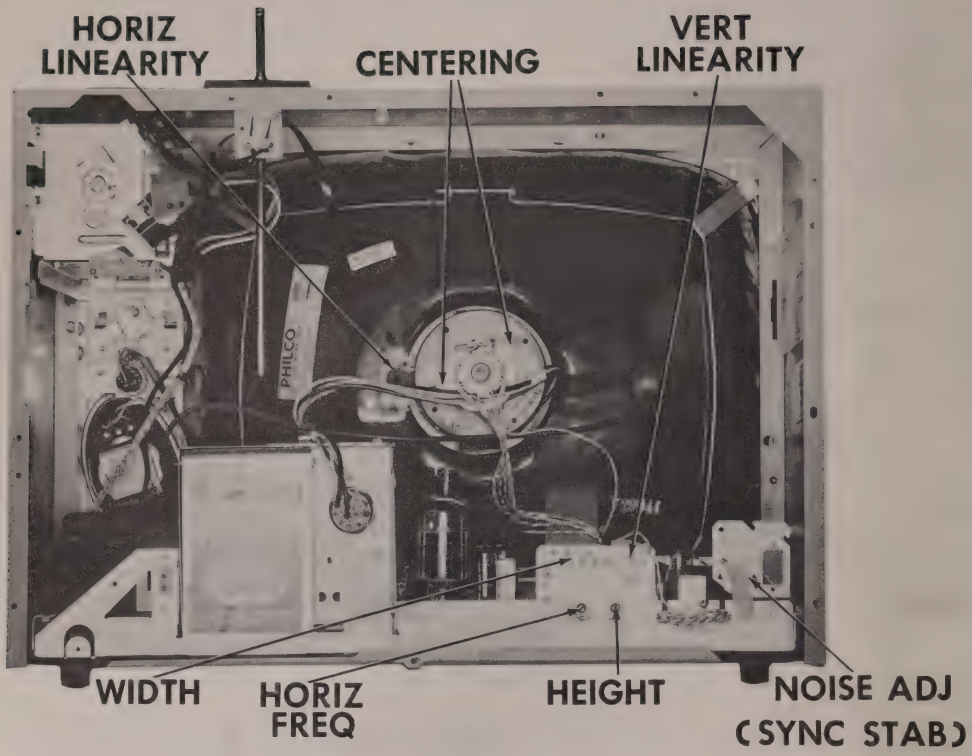
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	100K	56Ω	.1Ω	0Ω	†240K	†240K	0Ω		
V2	6DK6	110K	†240K	.1Ω	0Ω	†1400Ω	†1400Ω	†240K		
V3	6HJ8	120Ω	0Ω	†3300Ω	.1Ω	0Ω	†3300Ω	0Ω	3900Ω	0Ω
V4	6AW8A	0Ω	1.4meg	†30K	0Ω	.1Ω	•70Ω	3900Ω	†21K	†6000Ω
V5	6BY8	†30K	†2700Ω	0Ω	0Ω	.1Ω	1meg	400K	†10K	†2700Ω
V6	6EA8	†28K	.5Ω	†12K	.1Ω	0Ω	†12K	150Ω	•3200Ω	2.4meg
V7	6CS6	15K	330Ω	0Ω	.1Ω	†180K	†11K	3Ω		
V8	6BQ5	NC	100Ω	330Ω	0Ω	.1Ω	NC	†1000Ω	NC	†720Ω
V9	6DR7	†300Ω	NC	2meg	0Ω	.1Ω	•†4.5meg	68K	•90K	•500Ω
V10	6CG7	†10K	2meg	1000Ω	0Ω	.1Ω	†45K	•110K	1000Ω	0Ω
V11	6DQ6B	NC	.1Ω	NC	•†16K	800K	NC	0Ω	0Ω	TOP CAP †13Ω
V12	6DA4	NC	NC	¶	NC	†40Ω	NC	0Ω	.1Ω	
V13	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †490Ω
V14	19ABP4	.1Ω	NC	39K	†280K	NC	†280K	•160K	0Ω	
V201	ECC189 6ES8	†4700Ω	†400K	INF	0Ω	.1Ω	INF	1meg	0Ω	0Ω
V202	6X8	0Ω	10K	†28K	0Ω	.1Ω	0Ω	220K	†28K	†11K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
† MEASURED FROM PIN 3 OF V12. NC NO CONNECTION



VIDEO IF PRINTED BOARD



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station signal. Allow the receiver to warm up. Connect a clip lead across the Horizontal Stabilizing Coil (L20).

Set the Horizontal Hold to the center of its range.

Adjust the Horizontal Frequency Control (R9A) until the picture appears to float back and forth across the screen.

Remove the clip lead from across L20 and adjust the Horizontal Stabilizing Slug (B1) until the picture synchronizes horizontally.

Adjust Width Control (R6) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL J3702

1. Remove 8 metal screws holding rear cover. Remove rear cover.
2. Remove 9 push-on type knobs in front of cabinet.
3. Remove 4 metal screws holding control panel.
4. Remove picture tube socket, yoke plug, hi voltage lead, speaker leads, and tuner leads.
5. Remove 4 chassis bolts. Remove chassis.

TUNER REMOVAL

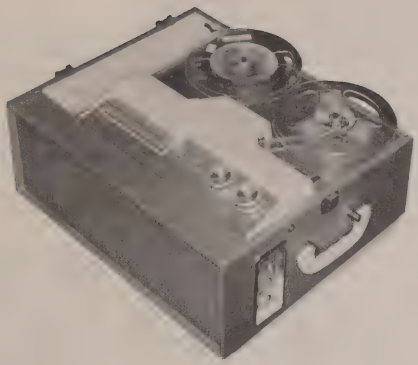
1. Remove 2 screws holding channel selector bezel.
2. Remove channel selector and fine tuning knobs.
3. Remove 2 screws from front and 2 at rear supporting tuner mounting bracket.
4. Remove tuner and bracket.

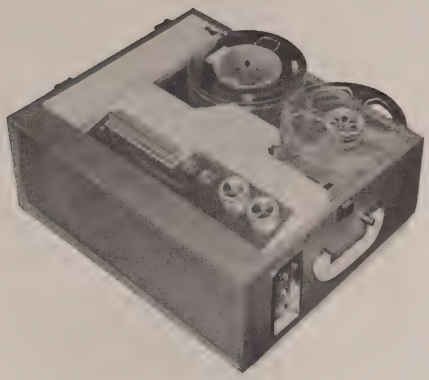
PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal.

PHOTOFACT® Folder with CIRCUITRACE®

AIRLINE MODELS
GTL-3841, GTL-3842A





AIRLINE MODELS
GTL-3841, GTL-3842A

GENERAL INFORMATION

Airline Models GTL3841A and GTL3842A are three-speed tape recorders and can play back both monaural and stereophonic recordings.

Model GTL3841A will record and play back monaural and play back stereo. Model GTL3842A will record and play back stereo. Recordings can be made from a microphone, radio, phonograph, tuner or TV set. An external speaker must be used to play back stereo recordings.

These models have three tape speeds, 7 1/2, 3 3/4 and 1 7/8 ips. A two-position equalization switch for 7 1/2 ips and 3 3/4 or 1 7/8 ips is provided. Using both tracks, recording times are as follow:

Tape Length	7 1/2 ips.	3 3/4ips.	1 7/8 ips.
1200 ft.	1 hour	2 hours	4 hours
1800 ft.	1 1/2 hours	3 hours	6 hours
2400 ft.	2 hours	4 hours	8 hours

These recorders operate on 60 cycles, 105-120 volts AC only.

Supplied by:

Montgomery Ward & Co.
619 Chicago Avenue
Chicago 7, Illinois

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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CQ439

SET 511 FOLDER 3

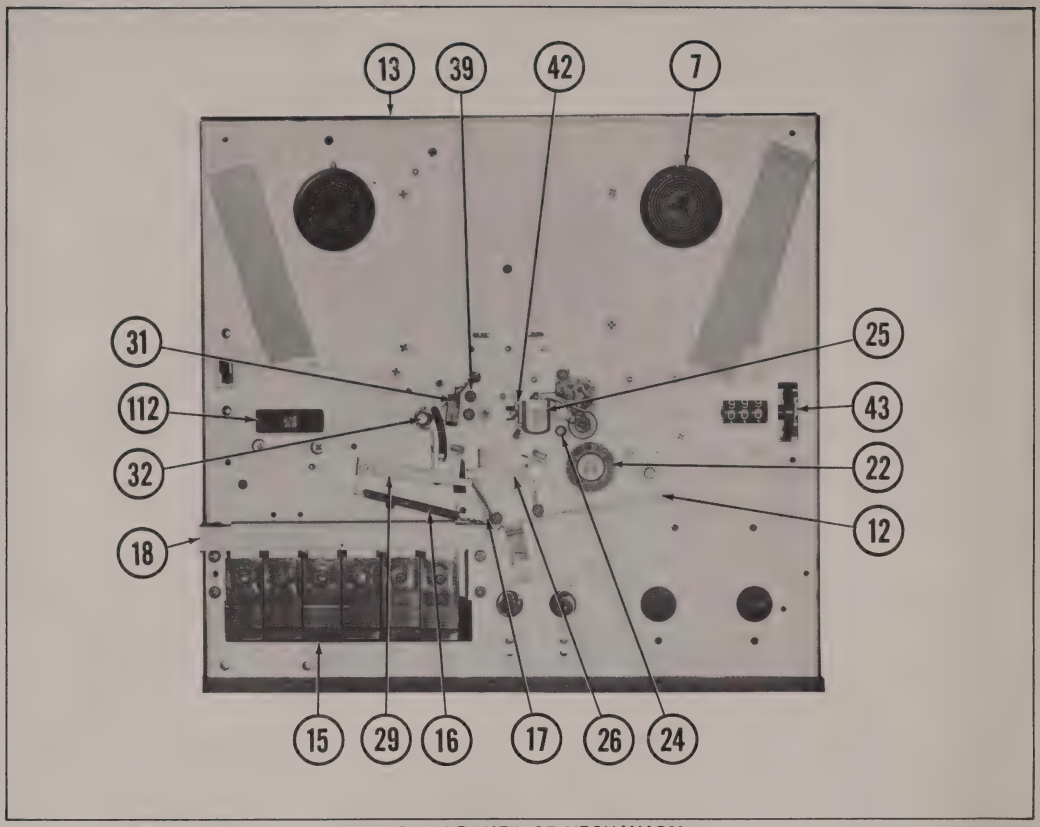


FIG. 1 TOP VIEW OF MECHANISM

FUNCTION OF CONTROLS

Power On-Off, Volume Control #1

Turns power on and off for entire unit. Regulates volume on monaural playback. Determines recording level. Controls first-channel volume on stereo playback on Model GTL3841A and regulates the record level and playback for the first channel stereo on Model GTL3842A.

Volume Control #2

On Model GTL3841A, it controls the volume for stereo playback only. On Model GTL3842A, it controls the record level and volume for stereo recording and playback.

Tone Control #1

Controls bass and treble response on monaural playback; first channel tone on stereo playback. It does not function during record.

Tone Control #2

Functions on second channel stereo playback only.

Rotary Speed Selector

Selects desired tape speed: 7 1/2, 3 3/4, or 1 7/8 ips. This control cannot be turned unless the pushbuttons are in the Stop position.

Equalization Switch

In up position, it equalizes response for 7 1/2 ips speed and down position for 3 3/4 and 1 7/8 ips speeds.

FUNCTION OF PUSHBUTTONS

In order for the pushbuttons to work properly, they should be depressed firmly. All buttons lock into position when depressed except stop and pause. The recorder can be changed from one function to another

immediately except from wind and rewind to play; in this case, the stop button must first be depressed.

Stop

Applies brake to both spindles and returns all pushbuttons to neutral.

Record

Moves play-record switch into record position.

Rewind

Returns tape rapidly to supply reel. Moves wind-rewind pulley, increasing tension on rewind belt which turns supply spindle.

Wind

Moves tape rapidly in play and record direction. Moves wind-rewind pulley, increasing tension on wind belt which turns takeup spindle.

Play

Moves tape for playback (or recording, if Record button is depressed simultaneously). Brings pressure roller and pressure pads into position against capstan and record head.

Pause

Stops tape by removing pressure roller from capstan and applying the brake to the spindles. Record or playback settings are not disturbed.

On-Off Monitor

Turns speaker on or off for monitoring during recording.

INPUT AND OUTPUT JACKS

External Speakers 1 and 2

Used when connecting external speakers for playback. Speaker 1 jack is used for monaural playback; when a speaker is plugged in, it disconnects the internal speaker of the recorder. Speaker 2 jack is used for channel two on stereo playback with the internal speaker of the recorder or with an external system plugged into speaker jack 1.

Stereo Phono 1 and 2

Used for connecting phono outputs to recorder for recording stereophonic records.

Microphone Low Level

Plug microphone into this jack for microphone recordings.

Radio Phono

A high level input used when recording from radio, phonograph, tuner, etc., by means of a patch cord.

OPERATING INSTRUCTIONS

Threading the Tape

Place reel of tape on left spindle; empty reel on right spindle. Thread tape in slot with shiny side toward the front of recorder. Insert loose end of tape into one of the slots in the empty reel and turn reel counterclockwise to take up slack in the tape.

To Make Recording

Plug the microphone into the Low Level input jack. Set the rotary Speed Selector to the desired speed. Turn on the power by rotating On-Off Volume control #1 clockwise until a click is heard. Allow sufficient time for the tubes to warm up. Depress the Record button and adjust Volume control #1 so the level light will flicker on the loudest passage. Hold the Record button down and depress the Play button until both are locked in the down position. If both buttons will not stay down or a buzzing noise is heard, the tape is not properly threaded. Depress the Stop button at the end of a recording; at the end of the tape, the recorder will stop automatically.

Hold the microphone approximately eight inches from the mouth when recording voice. Place the microphone two or three feet in front of the loudspeaker when recording from a radio, phonograph, or TV set.

Hold the Pause button down to interrupt a recording briefly. The recorder will continue to record when the Pause button is released.

These models are dual-track recorders. The top half of the tape is used during a recording. After the entire reel is recorded, the full reel is removed from the takeup spindle, turned over, and placed on the supply spindle. After threading the tape, a new recording can be made. This doubles the playing and recording time of a reel of tape.

It is possible to record directly from a radio, phonograph, tuner, or TV set by connecting a patch cord between the High Level jack and the desired instrument.

To Wind or Rewind Tape

Depress the Wind or Rewind button to move the tape in the desired direction. Depress the Stop button to stop the tape. The recorder will stop automatically at the end of the reel.

To Play Monaural Recordings

Thread the tape as described under "Threading the Tape". Depress the Play button. Adjust Volume and Tone controls #1. Volume and Tone controls #2 should be turned fully counterclockwise.

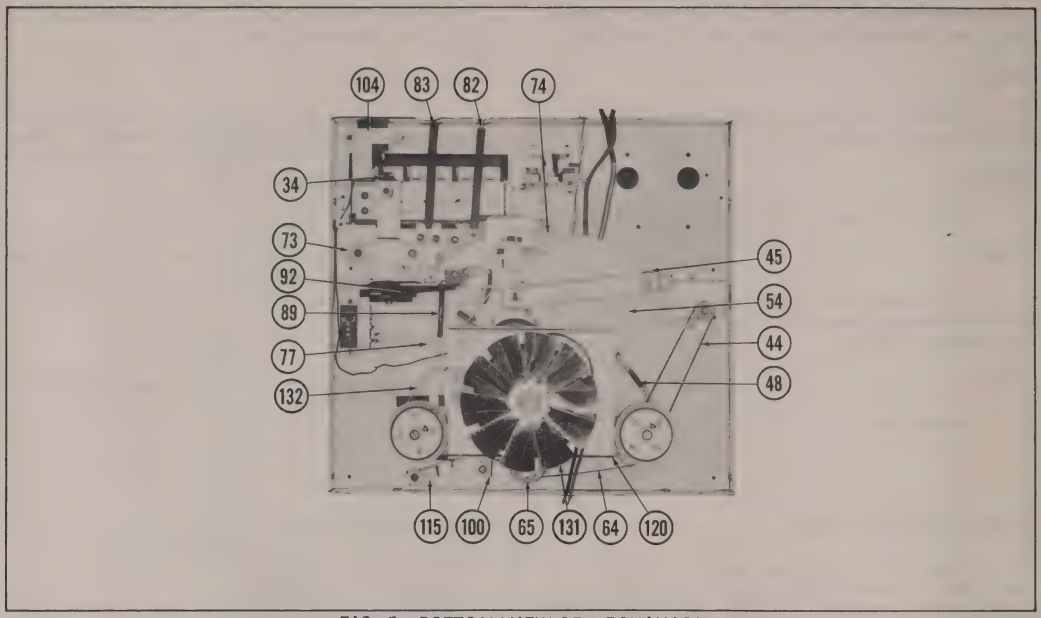


FIG. 2 BOTTOM VIEW OF MECHANISM

To Play Stereophonic Tapes

A second speaker system is required to play stereo tapes. Plug the second speaker system into External speaker jack 2. Adjust Volume and Tone controls #1 for the first channel and Volume and Tone controls #2 for the second channel.

To Make a Stereophonic Recording - Model GTL-3842A

Plug one microphone into the Low Level input jack #1, and another microphone into Low Level input jack #2. Rotate the On-Off Volume control #1 clockwise until a click is heard to turn the power on. Adjust Volume control #1 and Volume control #2 so the Level lights will flicker on the loudest passage of sound. Hold Record button down and depress the Play button until both are locked into position. If both buttons will not stay down or a buzzing noise is heard, the tape is not properly threaded.

Hold the microphone approximately eight inches from the mouth when recording voice and two or three feet from the loud-speaker when recording from a radio, phonograph, or TV set.

Hold the Pause button down to interrupt a recording briefly. The recorder will continue to record when the pause button is released.

To Edit and Splice Tape

Since one track cannot be spliced without affecting the other, recordings to be edited should be limited to one-track tapes. Unwanted portions can be cut out and the desired selections joined together. Tape should be cut at a slight diagonal and the ends joined together with splicing tape on the glossy side. Excess splicing tape should be trimmed from the sides of the tape.

NOTE: Use splicing tape only. Do not use regular cellophane tape.

To Use as a Public Address System

Plug the microphone into Stereo Phono 1 jack. The internal speaker of the recorder can be used or an external system can be plugged into External speaker 1 jack. Do not point the speaker toward the microphone, because this will cause feedback which will produce howl.

Head Lifter

Push left lever of head lifter down for four-track recordings, and right lever down for two-track recordings.

DISASSEMBLY

To Remove Recorder From Case

1. Remove escutcheon from input and output jacks.
2. Remove four screws from bottom of case and four bolts from side.
3. Set case on side with speaker down and slide mechanism forward.
4. Unsolder speaker leads.
5. Reverse foregoing procedure to reassemble.

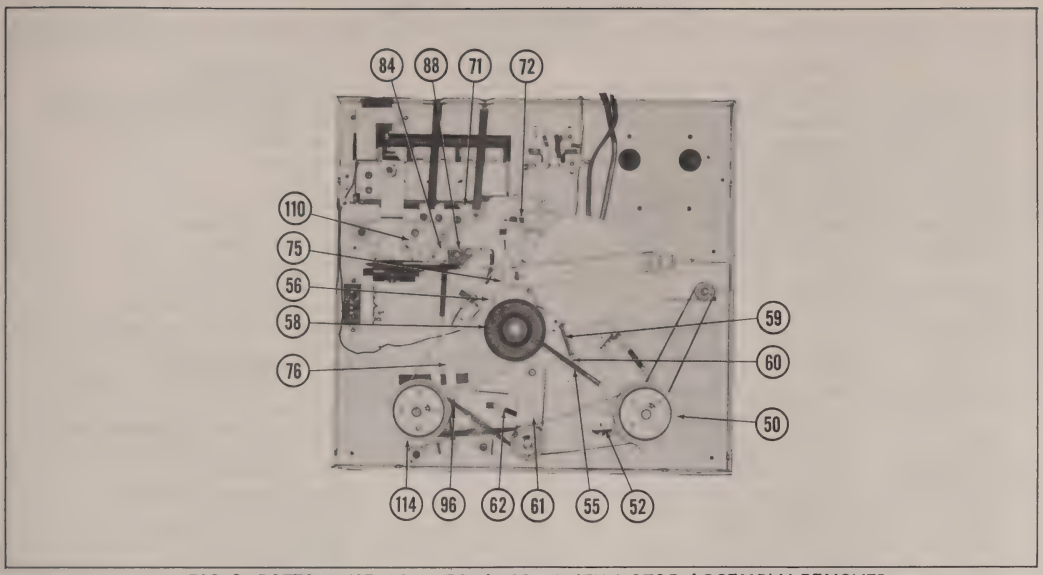


FIG.3 BOTTOM VIEW OF MECHANISM WITH MOTOR ASSEMBLY REMOVED

ADJUSTMENTS

To Align Erase Head

Loosen mounting nuts and set erase head so that top of head gap is even with top of tape. Tighten mounting nuts.

To Align Record-Playback Head

1. Put head in up position by pushing down on left tab of head mounting bracket assembly (42).
2. Loosen mounting nuts at side of head mounting bracket assembly (42). Set top of upper gap evenly with top of tape. Tighten mounting nuts.
3. Adjust for maximum output by turning alignment screw, on right side of mounting bracket, while playing a prerecorded alignment tape.
4. Repeat steps 2 and 3.

CLEANING

Pressure roller (22), capstan, and recording head (25) should be cleaned occasionally of dirt and foreign matter with a soft cloth moistened with alcohol.

LUBRICATION

These recorders do not require lubrication under normal use. When disassembled for repair, wipe all bearings and sliding levers with a clean soft cloth and apply a thin coat of oil to their surfaces.

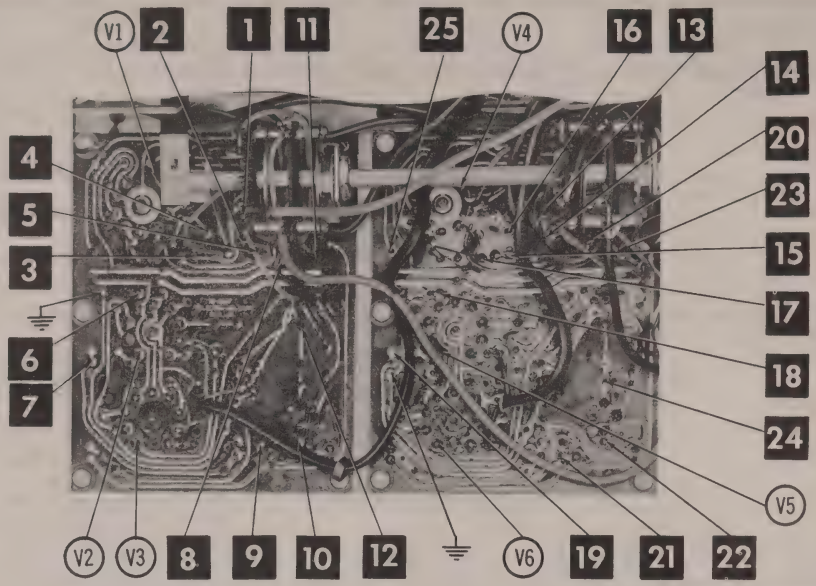
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TA-1523	Volume Control Knob - Model GTL-3841A	6		Escutcheon Screw, 6-32 x 7/8 Ph. Hd.
	TA-1255	Volume Control Knob - Model GTL-3842A	7	TS-2152	Spindle
2	TK-246-1	Tone Control Knob - Model GTL-3841A	8		Washers
			9		Ball Race
	TK-246	Tone Control Knob - Model GTL-3842A	10	5133-25	Retaining Ring
			11		Washer .255 I.D. x 1/2 O.D. x .010 Thick Steel
3		Screw, 6-32 x 1/4 Phil. Truss. Hd.	12	TA-1488	Pressure Roller Plate Ass'y.
4	TP-1249-2	Dress Plate - Model GTL-3841A	13	TB-2151	Motor Board
	TP-1249	Dress Plate - Model GTL-3842A	14	TE-276-5	Rear Escutcheon- Model GTL-3841A
5	TA-1522	Escutcheon - Model GTL-3841A			
	TA-1446	Escutcheon - Model GTL-3842A			

Ref. No.	Part No.	Description
14	TE-276-2	Rear Escutcheon-Model GTL-3842A
15	TB-1010-1	Pushbutton-Model GTL-3841A
	TB-1010	Pushbutton-Model GTL-3842A
16	TS-1993	Erase Head Pressure Pad Spring
17	TS-1902	Record Head Pressure Pad Spring
18	TA-1349	Pushbutton Ass'y. Bracket
19	TS-1985	Pushbutton Spring
20	5133-25	Retaining Ring
21		Washer, .255 I.D. x ½ O.D. x .010
22	TR-1846	Pressure Roller
23		Washer
24	TG-476	Right Tape Guide Post
25	TH-584	Record-Play Head 1/4 Track Stereo
26	TB-2130	Record Head Pressure Pad Brkt.
27		Screw, 6 x 3/8 Hex Sheet Metal Type Z
28	5133-12	Retaining Ring
29	TB-2137	Erase Head Pad Bracket
30	TB-1067	Pressure Roller Stop Plate Brkt.
31		Erase Head-Half Track - Model GTL-3841A Erase Head - 1/4 Track - Model GTL-3842A
32	TG-461	Left Tape Guide Post
33	TL-354-1	Stop Pushbutton Lever
34	TA-1560	Record Switch Lever
35	TL-354	Pushbutton Lever
36		Washer .203I.D. x 3/8 O.D. x 1/32
37	TS-1986	Record Switch Spring
38	5133-18	Retaining Ring
39	TB-2152	Erase Head Bracket
40		Tape Guide Wire
41	TS-1984	Pushbutton Latch Spring
42	TB-2028	Record-Play Head Mtg. Brkt.
43	TC-1747	Counter Ass'y.
44	TR-1614	Counter Drive Belt
45	TA-1252	Flywheel Thrust Plate Ass'y.
46		No. 6 Lockwasher
47		Screw, 6-32 x ½ Phil. Bdg.
48	TS-2085	Brake Cord Spring
49	TA-1183	Counter and Brake Pulley Ass'y.
50	265	Spindle Pulley for Drive Belt
51		Set Screw
52	TB-2180	Motor Mounting Bracket
53		Washer
54	TF-324	Flywheel
55	TS-1993-1	Idler Wheel Spring
56	TA-1174	Idler Arm Pivot Ass'y.
57		Fiber Washer
58	TW-424	Idler Wheel
59	TS-2041	Takeup Compression Spring
60	TA-1225	Idler Release Rod Assembly
61	TA-1163	Idler Pulley Arm Assembly
62	TS-1981	Wind Spring
63	TR-1548	Idler Drive Belt
64	TB-1018	Wind or Rewind Belt
65	TA-1489	Idler Pulley Assembly
66	TW-454	Fiber Thrust Washer
67	5133-25	Retaining Ring
68	TS-1988	Pause Linkage Spring
69	TS-2086	Swivel Head Lifter Shaft
70	TS-1911	Idler Elevation Shaft
71	TA-1176-1	Play Lever and Cam Ass'y.
72	TS-2244	Pressure Roller and Back Tension Spring
73	TA-1173-1	Brake Arm Assembly
74	TB-1050	Brake Cord Retainer Bracket
75	TA-1172	Idler Arm Support Speed Change Assembly
76	TR-1615	Push Rod
77	TR-1615	Push Rod
78		Washer
79	5133-25	Retaining Ring
80	TR-1416	Switch Cam Roller
81	5133-12	Retaining Ring
82	TS-2245	Cam Lever Spring
83	TS-1990	Brake Spring
84	TA-1169	Automatic Stop Actuator
85		Washer, 6 x 3/8 x 1/32 Fl. Steel
86		No. 6 Lockwasher
87		Screw, 6-32 x 3/8 Phil. Bdg. Hd. Mach.
88	TA-1170-1	Automatic Shutoff Bracket Ass'y.
89	TS-1993	Automatic Stop Spring
90	5133-12	Retaining Ring
91		Speed Selector Lift Lever (Part of Item 111)
92	TS-1980	Speed Selector Spring
93	5133-18	Retaining Ring
94		Washer, .192 I.D. x 3/8 O.D. x .010 Thick
95		Fiber Washer
96	TS-1981	Rewind Spring
97		Washer, No. 6 I.D. x 7/16
98		Screw, 6 x 3/8 Hex. Sheet Metal Type Z
99		Washer, .225 I.D. x ½ O.D. x .010 Thick
100	TL-346	Wind Spring Link
101		Fiber Washer
102		Washer, .225 I.D. x ½ O.D. x .010 Thick
103	5133-25	Retaining Ring
104	TL-361	Solenoid Arm Lever
105		Lockwasher
106		Screw
107		Steel Washer
108	5133-25	Retaining Ring
109	TS-2170	Speed Selector Locking Plate Spacer
110	TP-1008	Speed Selector Locking Plate
111	TA-1251	Speed Selector Bracket Ass'y.
112	TC-1741	Speed Selector Wheel
113	TA-1164	Brake Pulley
114	265	Spindle Pulley for Drive Belt
115	TL-367	Rewind Spring Link
116		Hex Nut
117		No. 6 Lockwasher
118		Washer, 6 x 7/16 O.D. x 1/32 Thk.
119		Washer
120	TP-1003-1	Motor Mounting Plate
121	TG-475	Grommet
122	TS-1942	Motor Mounting Spacer
123		Washer, 6 x 7/16 O.D. x 1/32 Thick
124	TA-1462	Motor and Pulley Ass'y.
125		Motor Pulley (Part of Item 124)
126	5133-18	Retaining Ring
127		Washer
128		Spring Washer
129		Fiber Washer
130		Felt Washer, 3/16 I.D. x 11/16 O.D. x 1/16 Thick
131	TF-339	Fan
132	TB-1093	Brake Cord, Dacron 24" Long

TROUBLE CHART

Symptom	Cause	Remedy
Tape fails to move when Play button is depressed.	1. Worn or dirty pressure roller (22). 2. Supply spindle binds. 3. Not enough pressure to hold pressure roller (22) against flywheel (54). 4. Idler wheel spring (55) weak or missing. 5. Posts of idler arm pivot (56) rusted or plate bent.	1. Clean or replace pressure roller (22). 2. Clean supply spindle or loosen brake cord. 3. Increase tension of back tension spring (72). Pressure should be 16-24 oz. 4. Replace idler wheel spring (55). 5. Clean posts or straighten plate.
Tape fails to move when Wind or Rewind button is depressed.	1. Idler drive belt (63) slipping or missing. 2. Brakes (132) too tight. 3. Wind or rewind belts (64) broken or too tight. 4. Idler pulley ass'y. (65) binding.	1. Clean or replace idler drive belt (63). 2. Loosen brake cord (132) from the motor mounting stud side. 3. Replace wind or rewind belt (64). Idler pulley arm (61) should have 1/16" ± 1/32" travel from left to right in idle position without stretching the belts. 4. Remove idler pulley (65), clean shaft on arm idler pulley ass'y., oil, and replace pulley.
Variation in speed after recorder has been in operation.	1. Pressure roller (22) too tight against flywheel (54). 2. Oil or dirt on flywheel (54), idler wheel (58), idler pulley (65), or motor pulley (125). 3. Wind-Rewind belts (64) too short. 4. Pressure pad springs (16) and (17) too tight.	1. Adjust as mentioned in remedy 3 of first symptom. 2. Clean surfaces of these parts with an industrial cleaner. 3. Adjust idler pulley arm (61) as mentioned in remedy 3 of preceding symptom. 4. Loosen springs by bending anchor back.
No speed change.	1. Speed change bracket (111) arm has jumped out of groove of idler arm (75). 2. Speed sliding post gummed up or corroded. 3. Support bracket of idler arm (75) jumped to left of play lever and cam bracket (71).	1. Reposition speed change bracket (111) arm in groove. Tighten lever retainer spring (92). Straighten speed change bracket (111). 2. Clean or replace sliding post and apply a thin film of oil. 3. Bend support bracket (75) down so it will clear top of play lever and cam bracket (71).
Automatic stop does not function.	1. Automatic stop switch out of position.	1. Adjust automatic stop switch so it trips when arm passes line of travel.
Automatic stop does not function.	1. Solenoid arm (104) too far from solenoid.	1. Bend solenoid arm (104) so that there is no more than 1/8" clearance between solenoid arm (104) and solenoid.
Incomplete Erase	1. Dirty erase head (31). 2. Defective electrical components.	1. Clean erase head (31) with soft cloth and alcohol. 2. Check voltages and resistances. Replace defective part.
Recording weak or distorted.	1. Dirty record-playback head (25). 2. Defective electrical components.	1. Clean record-playback head (25) with a soft cloth and alcohol. 2. Check voltages and resistances. Replace defective part.



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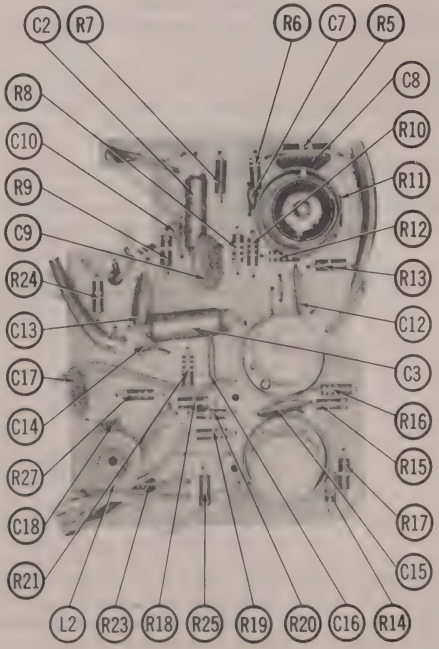
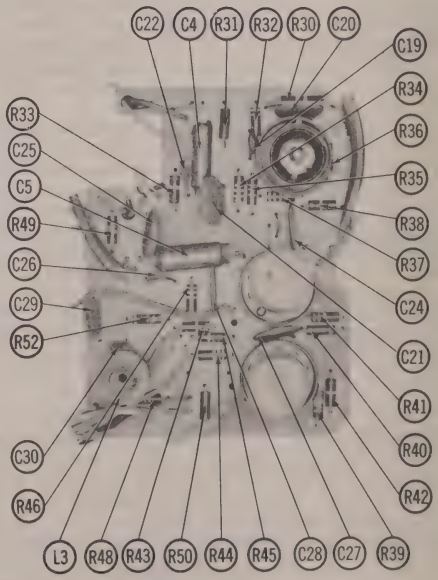
PRINTED BOARD—MODEL GTL-3842A

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

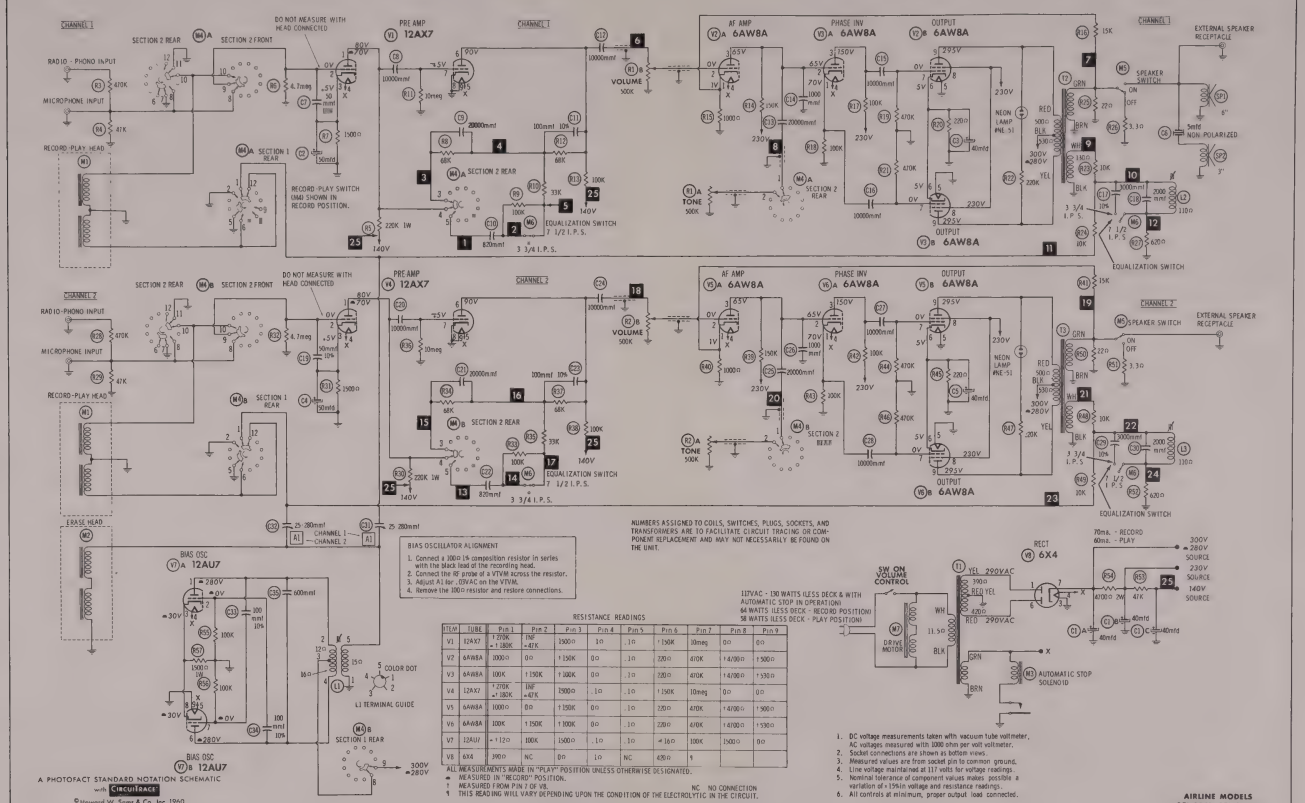




CHANNEL 1

PRINTED BOARDS—MODEL GTL-3842A

CHANNEL 2


CHANNEL 1
SECTION 2 REAR
SECTION 2 FRONT
DO NOT MEASURE WITH HEAD CONNECTED
RADIO - PHONO INPUT
MICROPHONE INPUT
RECORD-PLAY HEAD
RECORD-PLAY SWITCH SHOWN IN RECORD POSITION.
SECTION 1 REAR
PRE AMP V1 12AX7
CHANNEL 1
VOLUME 500K
AF AMP V2A 6AW8A
PHASE INV V3A 6AW8A
OUTPUT V2B 6AW8A
OUTPUT V3B 6AW8A
TONE 500K
EQUALIZATION SWITCH
7 1/2 I.P.S.
3 3/4 I.P.S.
NEON LAMP #NE-51
SPEAKER SWITCH
EXTERNAL SPEAKER RECEPTACLE
5mfd NON-POLARIZED
EQUALIZATION SWITCH
CHANNEL 2
PRE AMP V4 12AX7
AF AMP V5A 6AW8A
PHASE INV V5A 6AW8A
OUTPUT V5B 6AW8A
OUTPUT V6B 6AW8A
ERASE HEAD
BIAS OSC V7A 12AU7
BIAS OSC V7B 12AU7
BIAS OSCILLATOR ALIGNMENT
1. Connect a 3000 1% composition resistor in series with the black lead of the recording head.
2. Connect the RF probe of a VTVM across the resistor.
3. Adjust A1 for .07VAC on the VTVM.
4. Remove the 3000 resistor and restore connections.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SW ON VOLUME CONTROL
DRIVE MOTOR
RECT V8 6X4
117VAC - 130 WATTS (LESS DECK & WITH AUTOMATIC STOP IN OPERATION)
64 WATTS (LESS DECK - RECORD POSITION)
58 WATTS (LESS DECK - PLAY POSITION)
70mA - RECORD
60mA - PLAY
300V @ 280V SOURCE
230V SOURCE
140V SOURCE
AUTOMATIC STOP SOLENOID
RESISTANCE READINGS
ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
MEASURED IN "RECORD" POSITION.
MEASURED FROM PIN 7 OF V8.
THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC - NO CONNECTION
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
AIRLINE MODELS GTL-3841, GTL-3842A
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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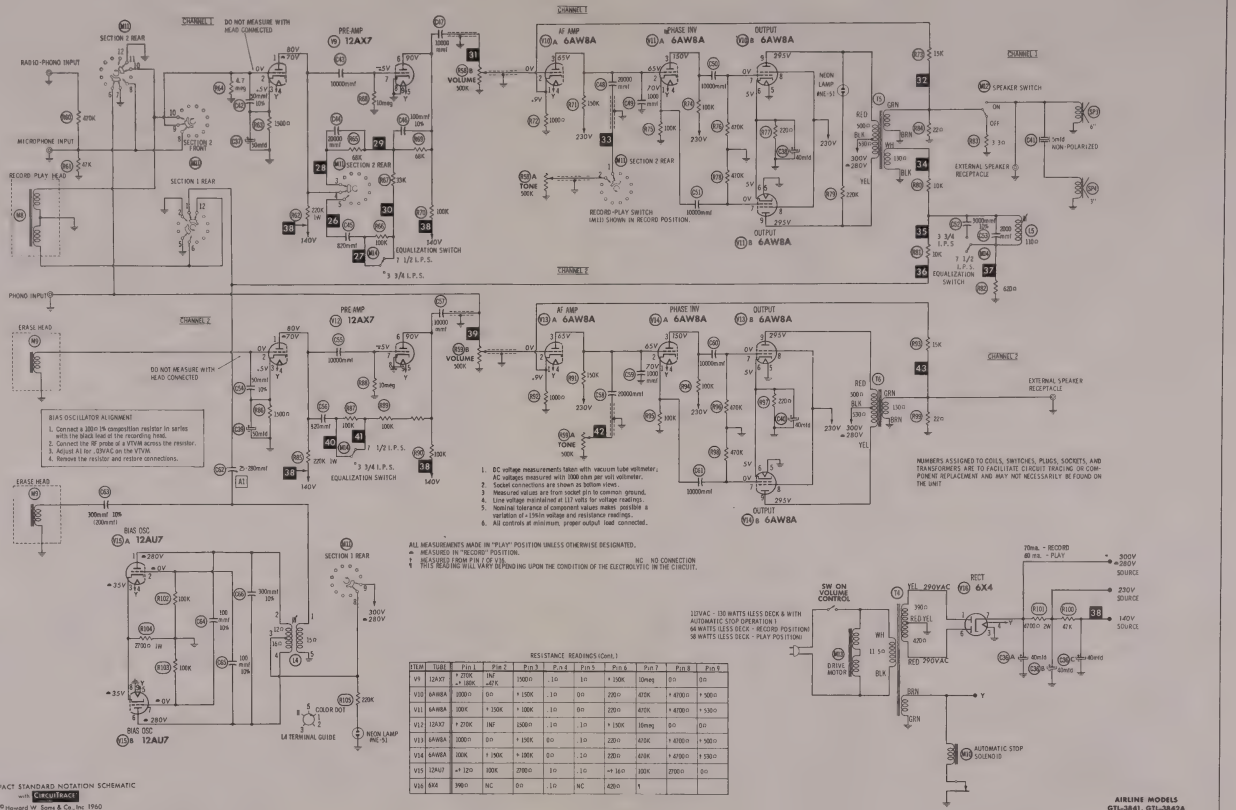
TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
12AX7	1 270K ↔ 1.8MEG	INF ↔ 47K	1500Ω	1Ω	.1Ω	1 150K	10meg	0Ω	0Ω
6AW8A	2000Ω	0Ω	1 150K	0Ω	.1Ω	220Ω	470K	1 4/300Ω	1 500Ω
6AW8A	100K	1 150K	1 100K	0Ω	.1Ω	220Ω	470K	1 4/300Ω	1 530Ω
12AX7	1 270K ↔ 1.8MEG	INF ↔ 47K	1900Ω	1Ω	.1Ω	1 150K	10meg	0Ω	0Ω
6AW8A	1000Ω	0Ω	1 150K	0Ω	.1Ω	220Ω	470K	1 4/300Ω	1 500Ω
6AW8A	100K	1 150K	1 100K	0Ω	.1Ω	220Ω	470K	1 4/300Ω	1 530Ω
12AU7	↔ 1120	100K	1500Ω	1Ω	.1Ω	↔ 160	100K	1500Ω	0Ω
6X4	390Ω	NC	0Ω	1Ω	NC	430Ω	1		


CHANNEL 1
CHANNEL 2
RADIO-PHONO INPUT
MICROPHONE INPUT
RECORD PLAY HEAD
PHONO INPUT
ERASE HEAD
PRE AMP
12AX7
AF AMP
6AW8A
PHASE INV
OUTPUT
VOLUME
TONE
SECTION 1 REAR
SECTION 2 FRONT
SECTION 2 REAR
DO NOT MEASURE WITH HEAD CONNECTED
EQUALIZATION SWITCH
3 3/4 I.P.S.
1 1/2 I.P.S.
7 1/2 I.P.S.
RECORD-PLAY SWITCH
SHOWN IN RECORD POSITION.
NEON LAMP
SPEAKER SWITCH
EXTERNAL SPEAKER RECEPTACLE
BIAS OSCILLATOR ALIGNMENT
1. Connect a 100 ohm 1% composition resistor in series with the black lead of the recording head.
2. Connect the RF probe of a VTVM across the resistor.
3. Adjust A1 for .03VAC on the VTVM.
4. Remove the resistor and restore connections.
BIAS OSC
12AU7
COLOR DOT
14 TERMINAL GUIDE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom view.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
= MEASURED IN "RECORD" POSITION.
NC - NO CONNECTION
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
RECT
6X4
300V 280V SOURCE
230V SOURCE
140V SOURCE
SW ON VOLUME CONTROL
DRIVE MOTOR
AUTOMATIC STOP SOLENOID
117VAC - 130 WATTS UNLESS DECK & WITH AUTOMATIC STOP OPERATION 1
64 WATTS (LESS DECK - RECORD POSITION)
58 WATTS (LESS DECK - PLAY POSITION)

RESISTANCE READINGS (Cont.)

TUBE	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V9	12AX7	+ 270K +* 180K	1MF +67K	1500Ω	.10	1Ω	+ 150K	10meg	0Ω	0Ω
V10	6AW8A	220Ω¶	0Ω	+ 150K	.10	0Ω	220Ω	470K	+ 47000Ω	+ 500Ω
V11	6AW8A	100K	+ 150K	+ 100K	.10	0Ω	220Ω	470K	+ 47000Ω	+ 530Ω
V12	12AX7	+ 270K	1MF	1500Ω	.10	.10	+ 150K	10meg	0Ω	0Ω
V13	6AW8A	220Ω¶	0Ω	+ 150K	0Ω	.10	220Ω	470K	+ 47000Ω	+ 500Ω
V14	6AW8A	100K	+ 150K	+ 100K	0Ω	.10	220Ω	470K	+ 47000Ω	+ 530Ω
V15	12AU7	+* 120	100K	2700Ω	10	.10	+* 160	100K	2700Ω	0Ω
V16	6X4	390Ω	NC	0Ω	.10	NC	420Ω	1		

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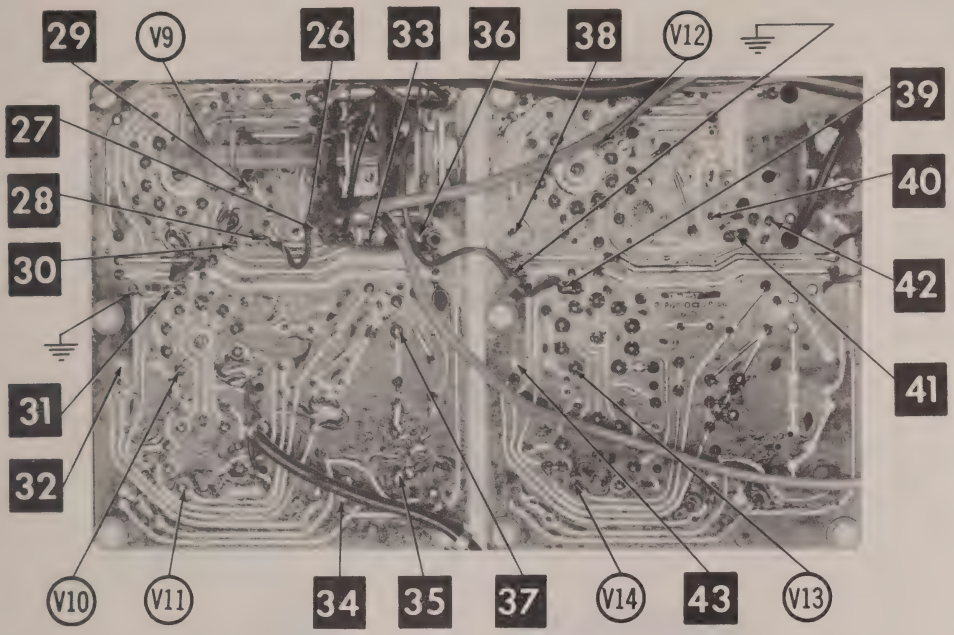
MODEL GTL-3841A

AIRLINE MODELS GTL-3841, GTL-3842A



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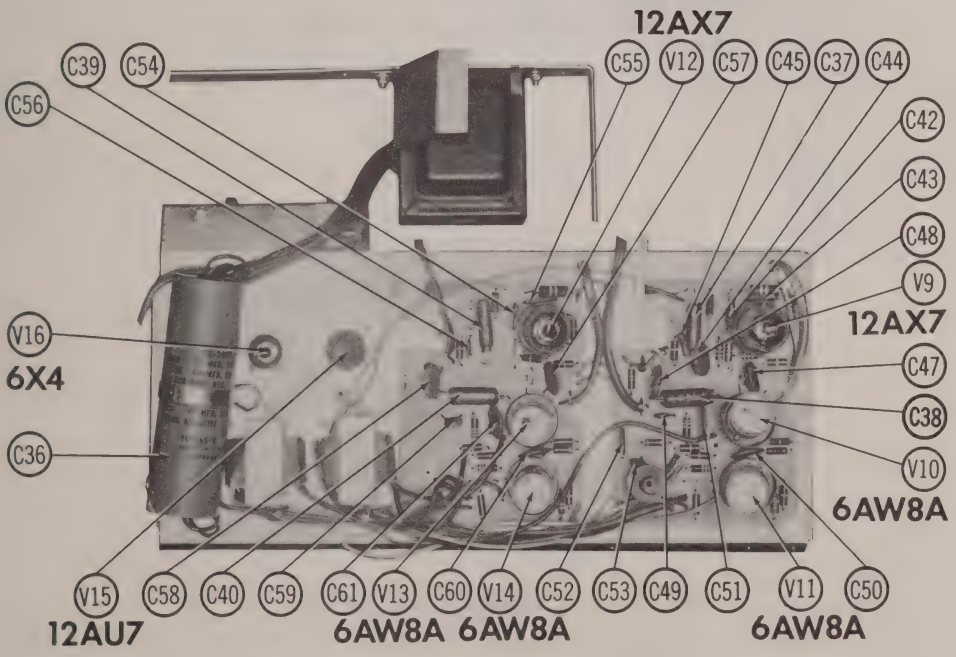
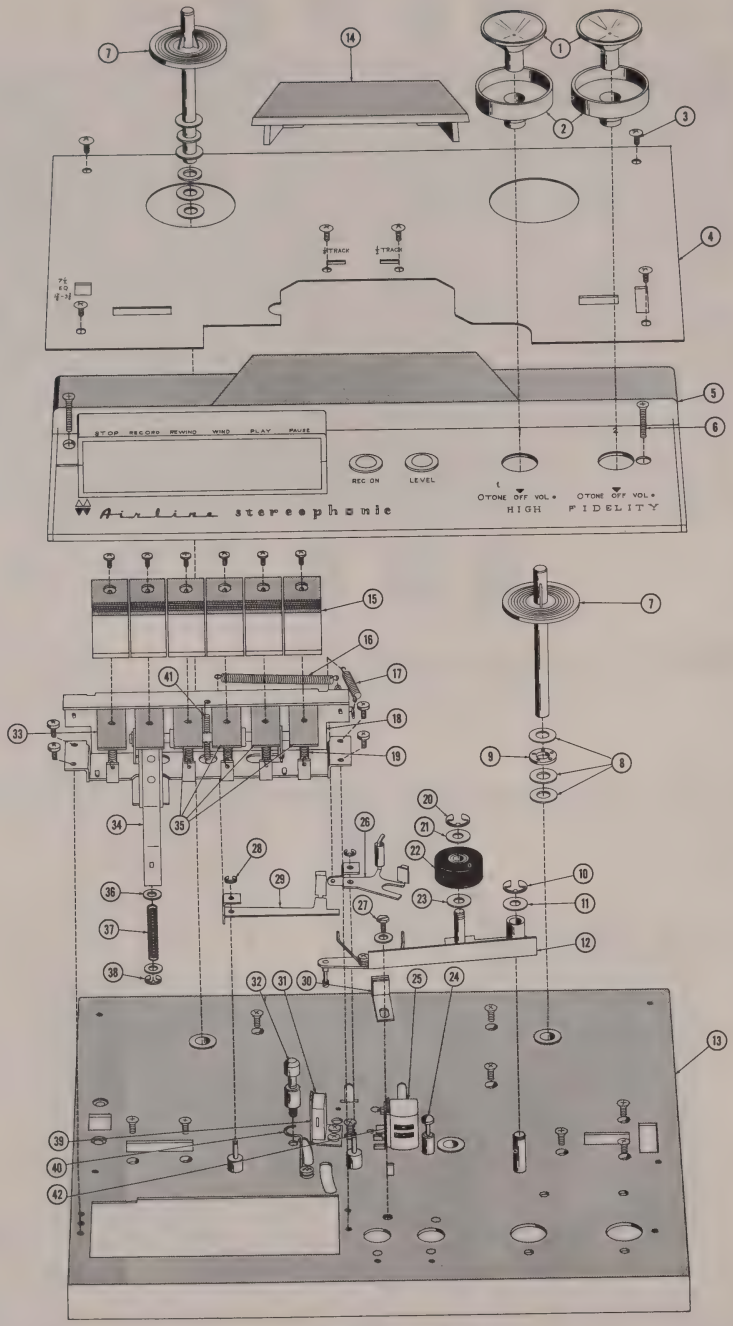
PRINTED BOARD—MODEL GTL-3841A

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS TOP VIEW—MODEL GTL-3841A



A PHOTOFACT "EXPLODED" VIEW
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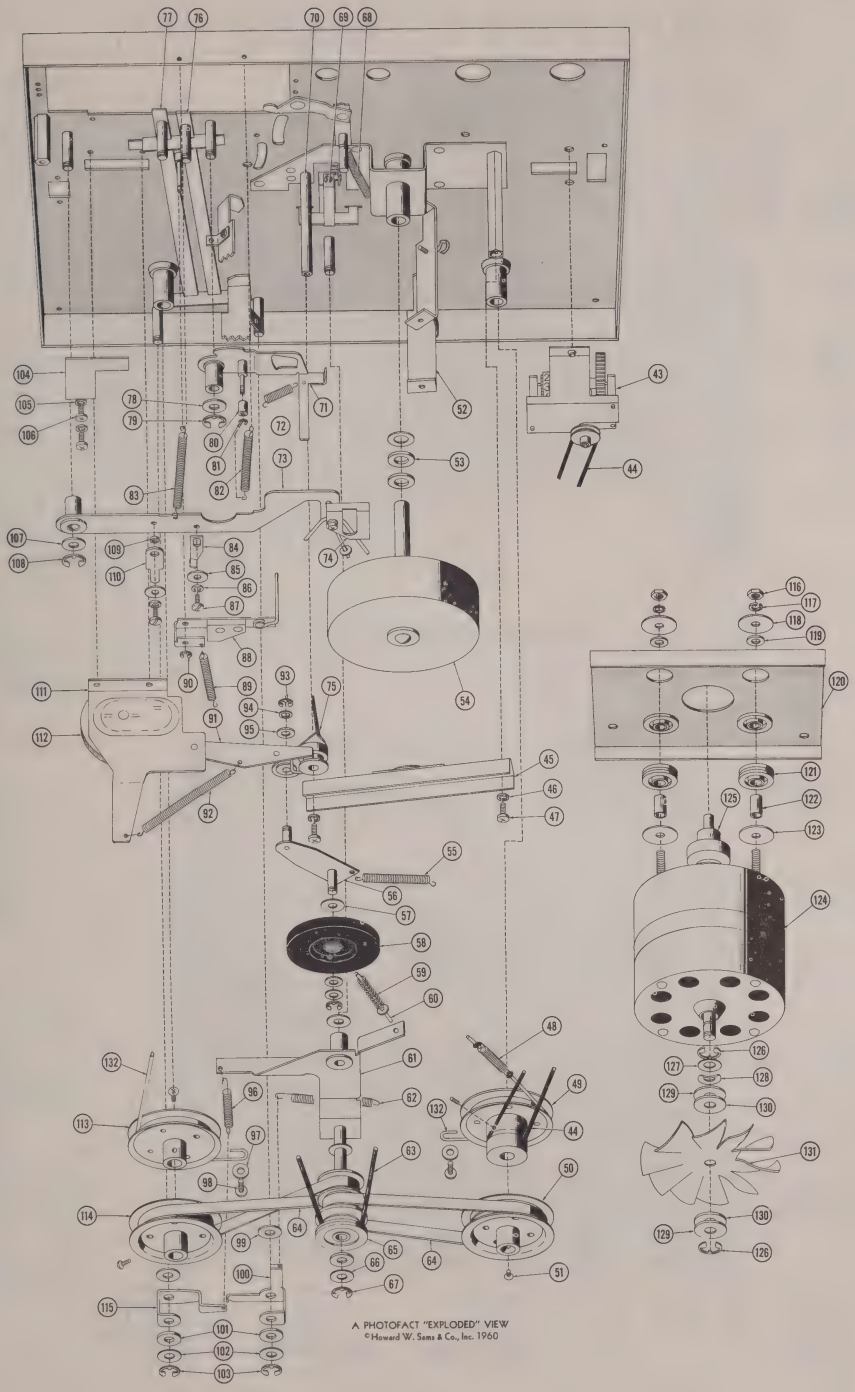
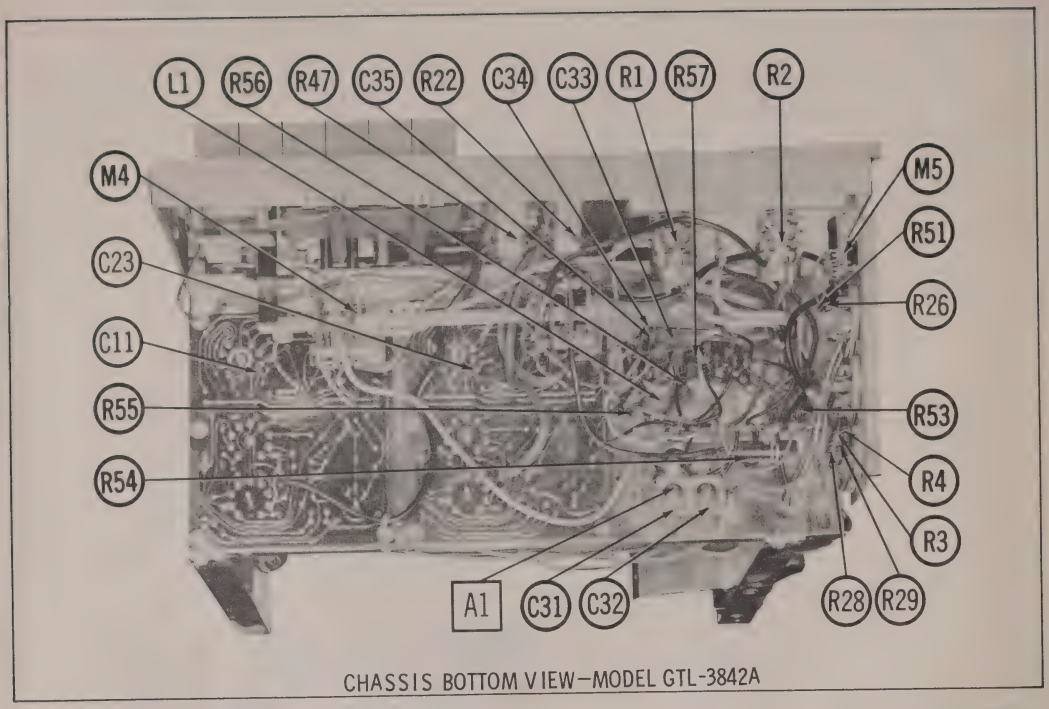
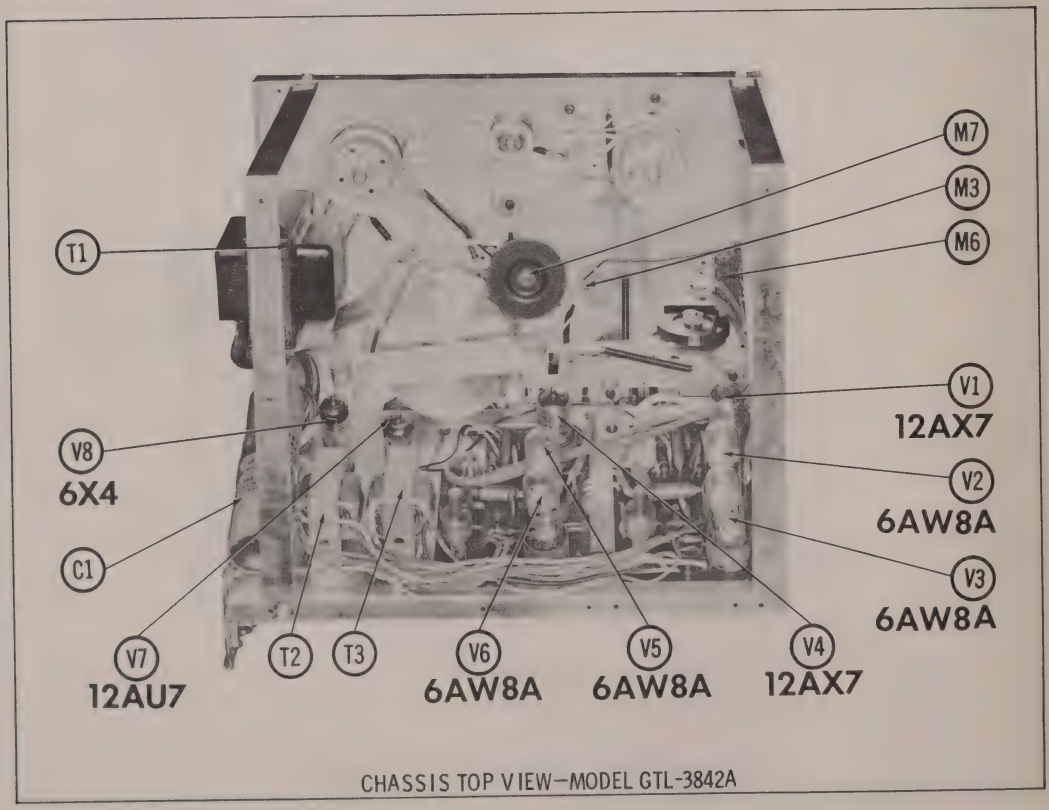
EXPLODED VIEW OF PARTS ABOVE BASE PLATE



EXPLODED VIEW OF PARTS BELOW BASE PLATE



CHASSIS BOTTOM VIEW—MODEL GTL-3842A



CHASSIS TOP VIEW—MODEL GTL-3842A

MODEL GTL–3842A PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Preamplifier	12AX7	V5	AF Amp. -Output	6AW8A
V2	AF Amp. -Output	6AW8A	V6	Phase Inv. - Output	6AW8A
V3	Phase Inv. - Output	6AW8A	V7	Bias Oscillator	12AU7
V4	Preamplifier	12AX7	V8	Rectifier	6X4

GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	300	TC-2001	PR3-020	BBRT0185	WQ795		TVAS-3745 *	
B	40	300							
C	40	300							
C2	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C3	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C4	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C5	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C6	5	10NP	TC-2000	PRS-7405	BBR4-150	TCN105		TVANS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C11	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	3000 10%		DI-3000		PM6D3	CCD-302	JL-233	10TS-D30
C18	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C19	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C22	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C23	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C26	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	3000 10%		DI-3000		PM6D3	CCD-302	JL233	10TS-D30
C30	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C31	25-280	#TC-2007				464		
C32	25-280	#TC-2007				464		
C33	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C34	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C35	600			DD-601	L10T3	CCS-621	GP360	10TS-T60

Airline Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2	TC-1721	F1-41				
B	500K	1/2		R2-41		† QJ-1510R	■UE4182-S	Tone, Channel 1
C	Switch			KR-1				Volume, Channel 1
R2A	500K	1/2	TC-1721	F1-41				Power Off-On
B	500K	1/2		R2-41		† QJ-1510R	■UE4182-S	Tone, Channel 2
C	Switch			KR-1				Volume, Channel 2
								(Not Used)

† "CONCENTRIKIT" equivalent: K-15 Kit with base elements & shafts: B13-133, P17-024, (Panel) B13-133, R1-103, (Rear) 76-1 (Switch)
(Not available as a factory assembled unit.)

■ "STA-LOC" equivalent: FB55A, RU55A, OS750A, IS 1187, US41.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	470K	
R4	47K	
R5	220K 1W	
R6	4.7meg	
R7	1500Ω	
R8	68K	
R9	100K	
R10	33K	
R11	10meg	
R12	68K	
R13	100K	
R14	150K	
R15	1000Ω	
R16	15K	
R17	100K	
R18	100K	
R19	470K	
R20	220Ω	
R21	470K	

ITEM No.	RATING	REMARKS
R22	220K	
R23	10K	
R24	10K	
R25	22Ω	
R26	3.3Ω	
R27	620Ω	
R28	470K	
R29	47K	
R30	220K 1W	
R31	1500Ω	
R32	4.7meg	
R33	100K	
R34	68K	
R35	33K	
R36	10meg	
R37	68K	
R38	100K	
R39	150K	
R40	1000Ω	

ITEM No.	RATING	REMARKS
R41	15K	
R42	100K	
R43	100K	
R44	470K	
R45	220Ω	
R46	470K	
R47	220K	
R48	10K	
R49	10K	
R50	22Ω	
R51	3.3Ω	
R52	620Ω	
R53	47K	
R54	4700Ω 2W	
R55	100K	
R56	100K	
R57	1500Ω 1W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	Osc. Coil	TC-1937				
L2	Equalization Coil	TC-1947				
L3	Equalization Coil	TC-1947				

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ 1.1A	580VCT @ .070A DC	6.3V@ 4.8A	TT-770					

MODEL GTL–3842A PARTS LIST (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.1	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9600Ω CT	3-4Ω	TT-774-1					
		SEC. 2						
		64Ω						
	PRI	SEC. 1						
T3	9600Ω CT	3-4Ω						
		SEC. 2						
		64Ω	TT-774					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	TS-2293	6A2i	
SP2	3"	PM	3-4Ω	TS-2292	3A15TZ3.1	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M1	Head	TH-584	1/4 Track Stereo, Record-Playback
M2	Head	TH-590	1/4 Track Stereo, Erase
M3	Solenoid	TC-1783-1	
M4A	Switch		Record-Playback, Channel 1 (Rotary Wafer Type)
B	Switch		Record-Playback, Channel 2 (Rotary Wafer Type)
M5	Switch		Speaker (DPDT Slide Type
M6	Switch		Power-Off-On (Slide Type)
M7	Motor Assembly	TA-1462	Includes Pulley
	Microphone	TM-410	Includes Cord and Plug

CABINETS & CABINET PARTS

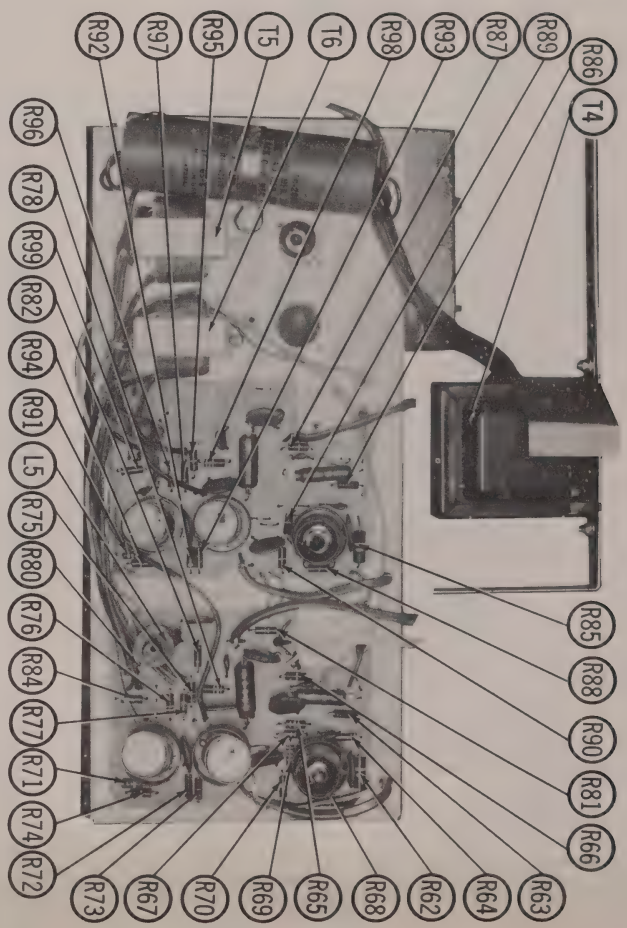
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	TA-1523	Volume, Model GTL-3841A
Knob	TA-1525	Volume, Model GTL-3842A
Knob	TK-246-1	Tone, Model GTL-3841A
Knob	TK-246	Tone, Model GTL-3842A
Button-Push	TB-1010-1	6 Used, Model GTL-3841A
Button-Push	TB-1010	6 Used, Model GTL-3842A

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS TOP VIEW–MODEL GTL–3841A



PARTS LIST—MODEL GTL—3841A

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V9	Preamplifier	12AX7
V10	AF Amp. -Output	6AW8A
V11	Phase Inv. - Output	6AW8A
V12	Preamplifier	12AX7
V13	AF Amp. -Output	6AW8A
V14	Phase Inv. - Output	6AW8A
V15	Bias Oscillator	12AU7
V16	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C36A	40	300	TC-2001	PR3-020	BBRT0185	WQ795		TVAS-3745 *	
B	40	300							
C	40	300							
C37	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C38	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C39	50	3	TC-1550	XPP-3050	NLW50-3	TT6X50	ML50-3	TE-1058	
C40	40	10	TC-1996	XPP-10040	NLW40-10	TT15X40	ML40-12	TE-1119	
C41	5	10NP	TC-2000	PRS-7405	BBR4-150	TCN105		TVANS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

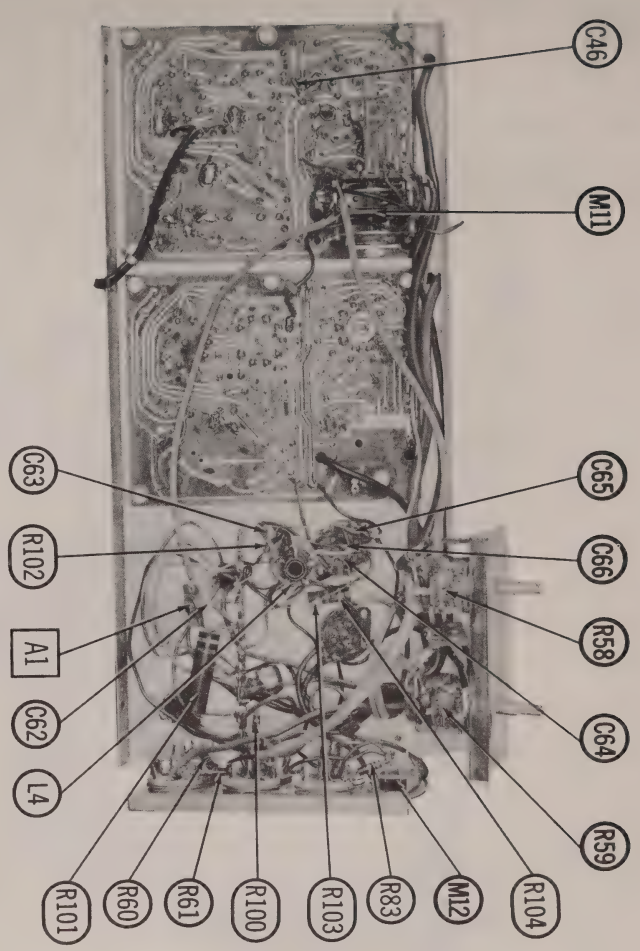
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C42	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C45	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C46	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C47	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C48	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C49	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C50	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	3000 10%		DI-3000		PM6D3	CCD-302	JL233	10TS-D30
C53	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C54	50 10%		DI-50	DD-500	L10Q50	CCD-500	GP450	10TS-Q50
C55	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C56	820		DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C57	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	20000		BPD-02	DD-203	BYA10D2	CCD-203	B-120	5HK-S20
C59	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C60	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C61	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C62	25-280	#TC-2007				464		
C63	300 10%	(200) †	DI-300	DD-301	L10T3	CCD-301	GP330	10TS-T30
C64	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C65	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C66	300 10%		DI-300	DD-301	L10T3	CCD-301	GP330	10TS-T30

\# Airline Part Number.
† Alternate Value.

CHASSIS BOTTOM VIEW—MODEL GTL—3841A



PARTS LIST MODEL GTL—3841A (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R58A	500K	½	TC-1721	F1-41		†QJ-1510R	■UE4182S	Tone, Channel 3
B	500K	½		R2-41				Volume, Channel 3
C	Switch			KR-1				Power Off-On
R59A	500K	½	TC-1721	F1-41		† QJ-1510R	■ UE4182S	Tone, Channel 4
B	500K	½		R2-41				Volume, Channel 4
C	Switch			KR-1				(Not Used)

† "CONCENTRIKIT" equivalent: K-15 Kit with base elements & shafts: B13-133, P17-024, (Panel)
(Not available as a factory assembled unit.) B13-133, R1-103, (Rear)
76-1 (Switch)

■ "STA-LOC" equivalent: FB55A, RU55A, OS750A, IS1187, US41.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	9600Ω CT	3-4Ω	TT-774					
		SEC. 2						
		64Ω						
	PRI.	SEC. 1						
T6	9600Ω CT	3-4Ω	TT-774-2	A-2938	A-3856	22S86	S-51X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP3	6"	PM	3-4Ω	TS-2293	6A21	
SP4	3"	PM	3-4Ω	TS-2292	3A15TZ3.1	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R60	470K	
R61	47K	
R62	220K 1W	
R63	1500Ω	
R64	4.7meg	
R65	68K	
R66	100K	
R67	33K	
R68	10meg	
R69	68K	
R70	100K	
R71	150K	
R72	1000Ω	
R73	15K	
R74	100K	
R75	100K	

ITEM No.	RATING	REMARKS
R76	470K	
R77	220Ω	
R78	470K	
R79	220K	
R80	10K	
R81	10K	
R82	620Ω	
R83	3.3Ω	
R84	22Ω	
R85	220K 1W	
R86	1500Ω	
R87	100K	
R88	10meg	
R89	100K	
R90	100K	
R91	150K	

ITEM No.	RATING	REMARKS
R92	1000Ω	
R93	15K	
R94	100K	
R95	100K	
R96	470K	
R97	220Ω	
R98	470K	
R99	22Ω	
R100	47K	
R101	4700Ω 2W	
R102	100K	
R103	100K	
R104	2700Ω 1W	
R105	220K	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M8	Head	TH-584	1/4 Track Stereo, Record-Playback
M9	Head	TH-556	1/4 Track Stereo, Erase
M10	Solenoid	TC-1783-1	
M11	Switch		Record-Playback (Rotary Wafer Type)
M12	Switch		Speaker (DPDT Slide Type)
M13	Motor Ass'y.	TA-1462	Includes Pulley
	Microphone	TM-410	Includes Cord & Plug

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L4	Osc. Coil	TC-1937				
L5	Equalization Coil	TC-1947				

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	117V@ 1.1A	580 VCT @ .070A DC	6.3V@ 4.8A	TT-770					

PHOTOFACT® Folder

ARKAY
MODEL CS-28

ARKAY
MODEL CS-28

ARKAY
MODEL CS-28

TRADE NAME	Arkay Model CS-28
MANUFACTURER	Arkay International, Inc., 88-06 Van Wyck Expressway, Jamaica 18, N. Y.
TYPE SET	AC Operated 11 Tube Stereo Amplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 145 Watts, 1.4 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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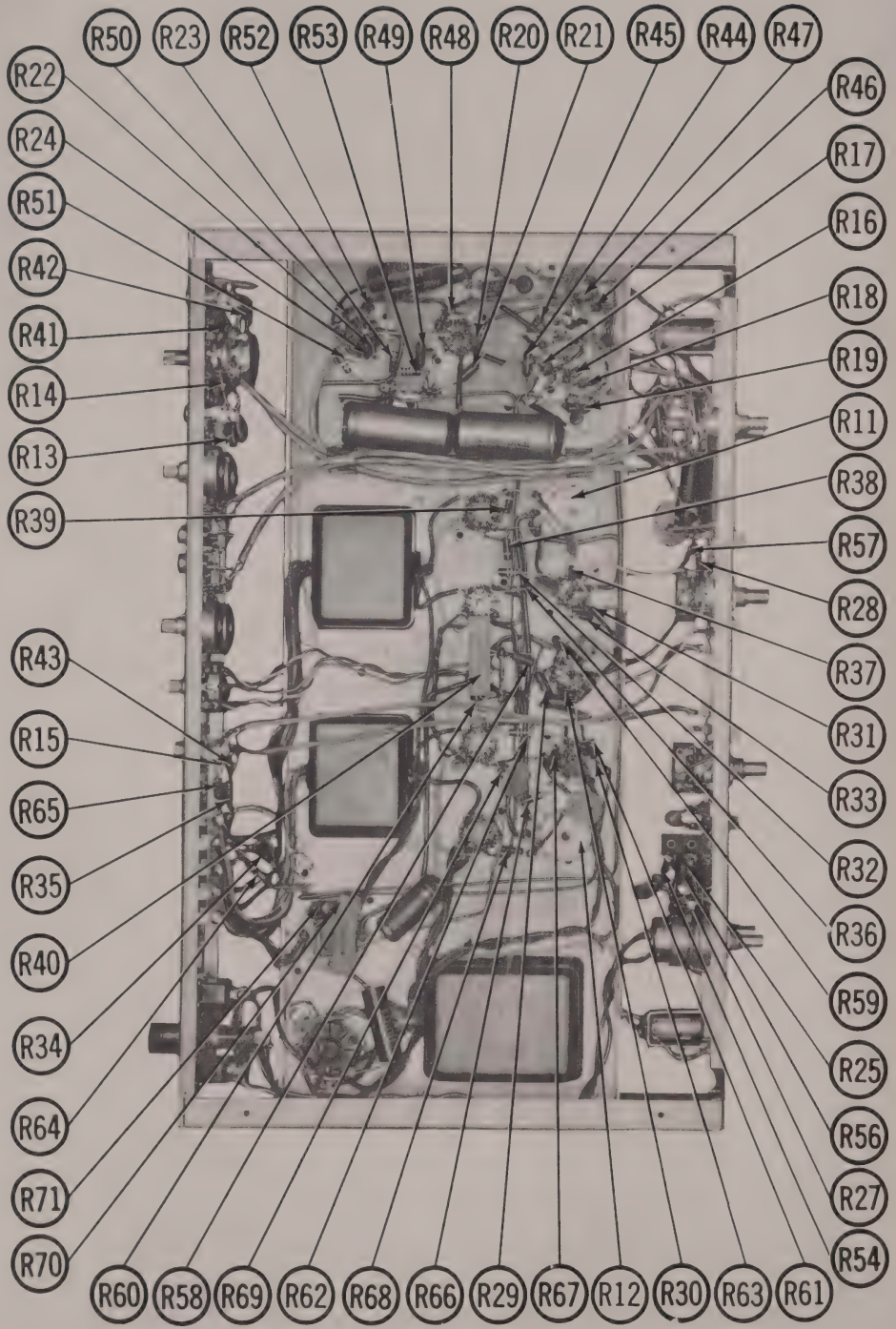
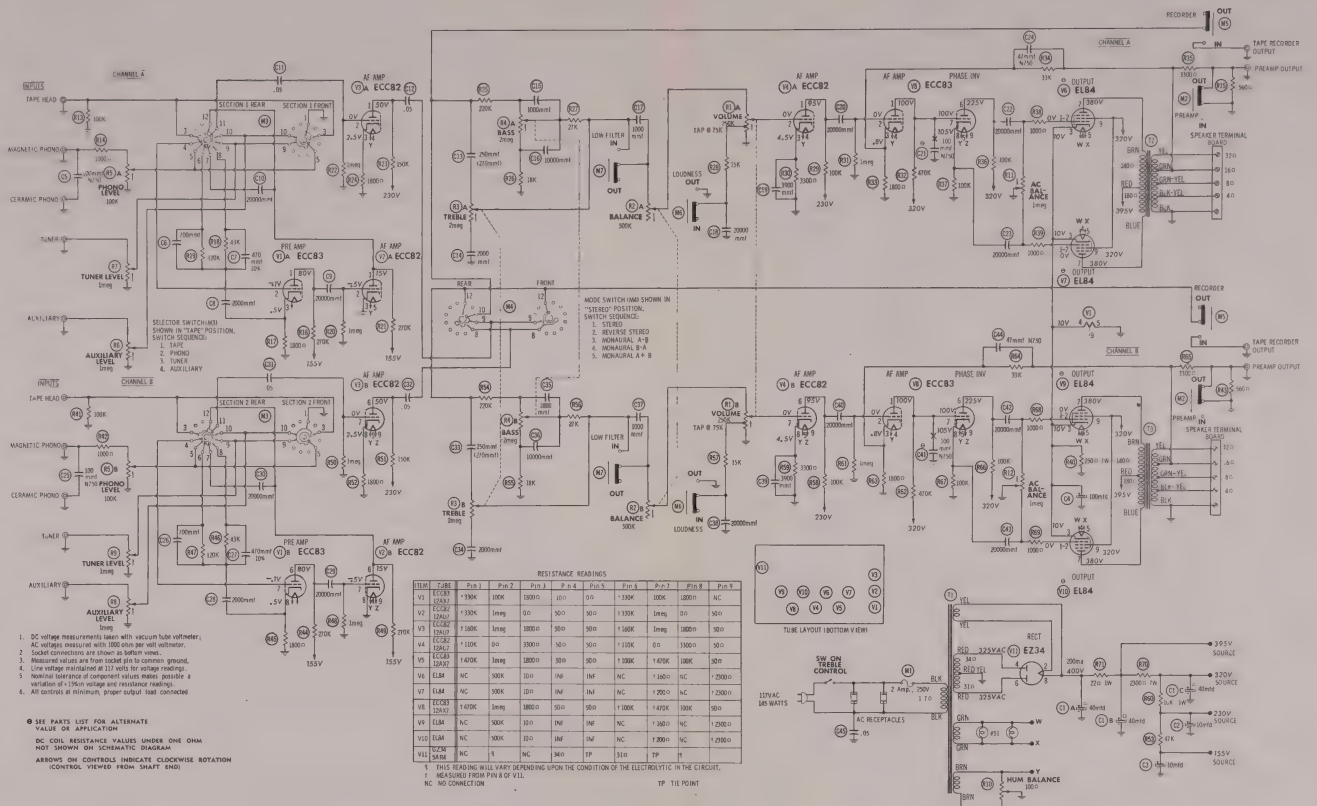


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	*330K	100K	1800Ω	1.0Ω	0.0	*330K	100K	1800Ω	NC
V2	ECC82 12AU7	*330K	1meg	0.0	50Ω	50Ω	*330K	1meg	0.0	50Ω
V3	ECC82 12AU7	*160K	1meg	1800Ω	50Ω	50Ω	*160K	1meg	1800Ω	50Ω
V4	ECC82 12AU7	*110K	0.0	330Ω	50Ω	50Ω	*110K	0.0	330Ω	50Ω
V5	ECC83 12AX7	*470K	1meg	1800Ω	50Ω	50Ω	*100K	470K	100K	50Ω
V6	EL84	NC	500K	10Ω	INF	INF	NC	*160Ω	NC	*2500Ω
V7	EL84	NC	500K	10Ω	INF	INF	NC	*200Ω	NC	*2500Ω
V8	ECC83 12AX7	*470K	1meg	1800Ω	50Ω	50Ω	*100K	*470K	100K	50Ω
V9	EL84	NC	500K	10Ω	INF	INF	NC	*160Ω	NC	*2500Ω
V10	EL84	NC	500K	10Ω	INF	INF	NC	*200Ω	NC	*2500Ω
V11	5U4G 5AR4	NC	5	NC	340Ω	TP	31Ω	TP	1	

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED FROM PIN 8 OF V1L.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±5% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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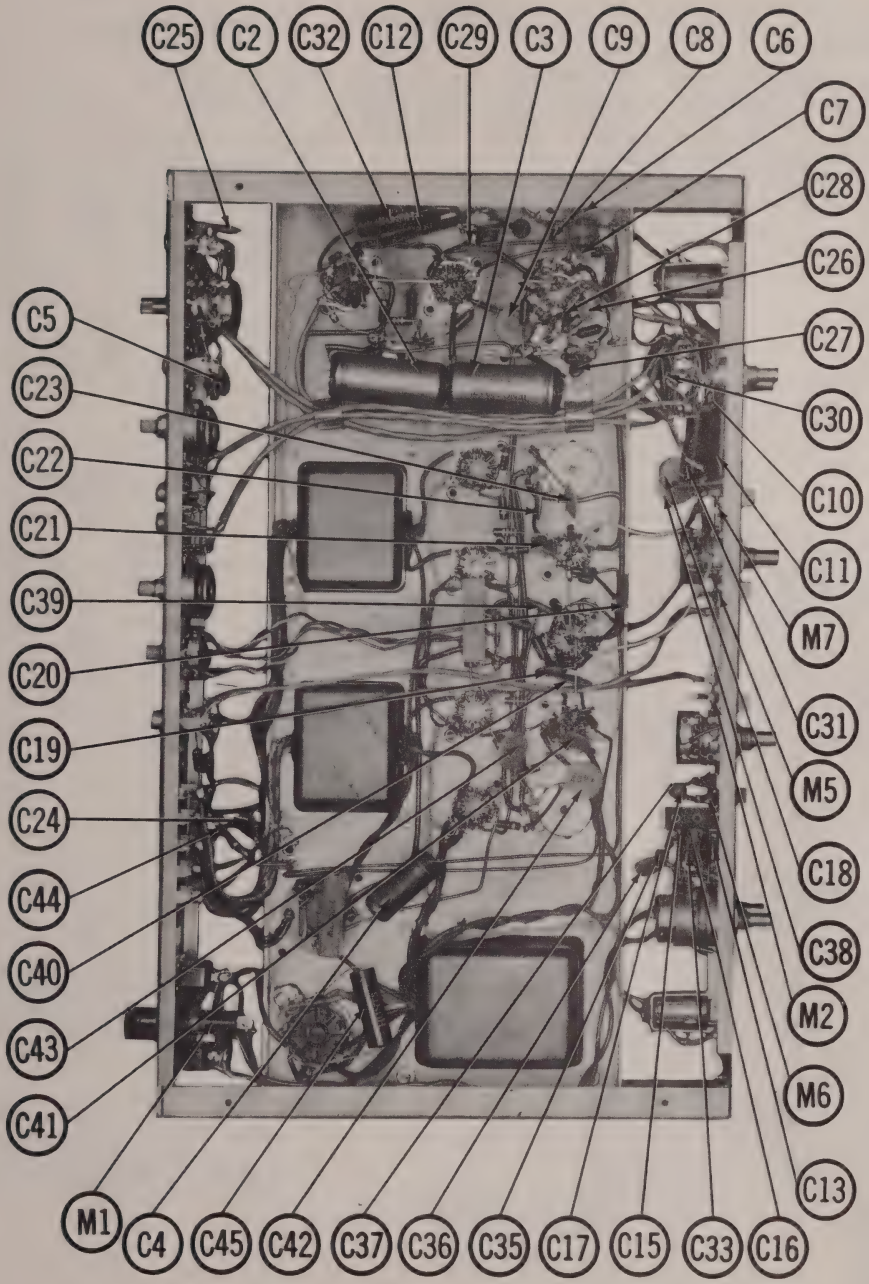
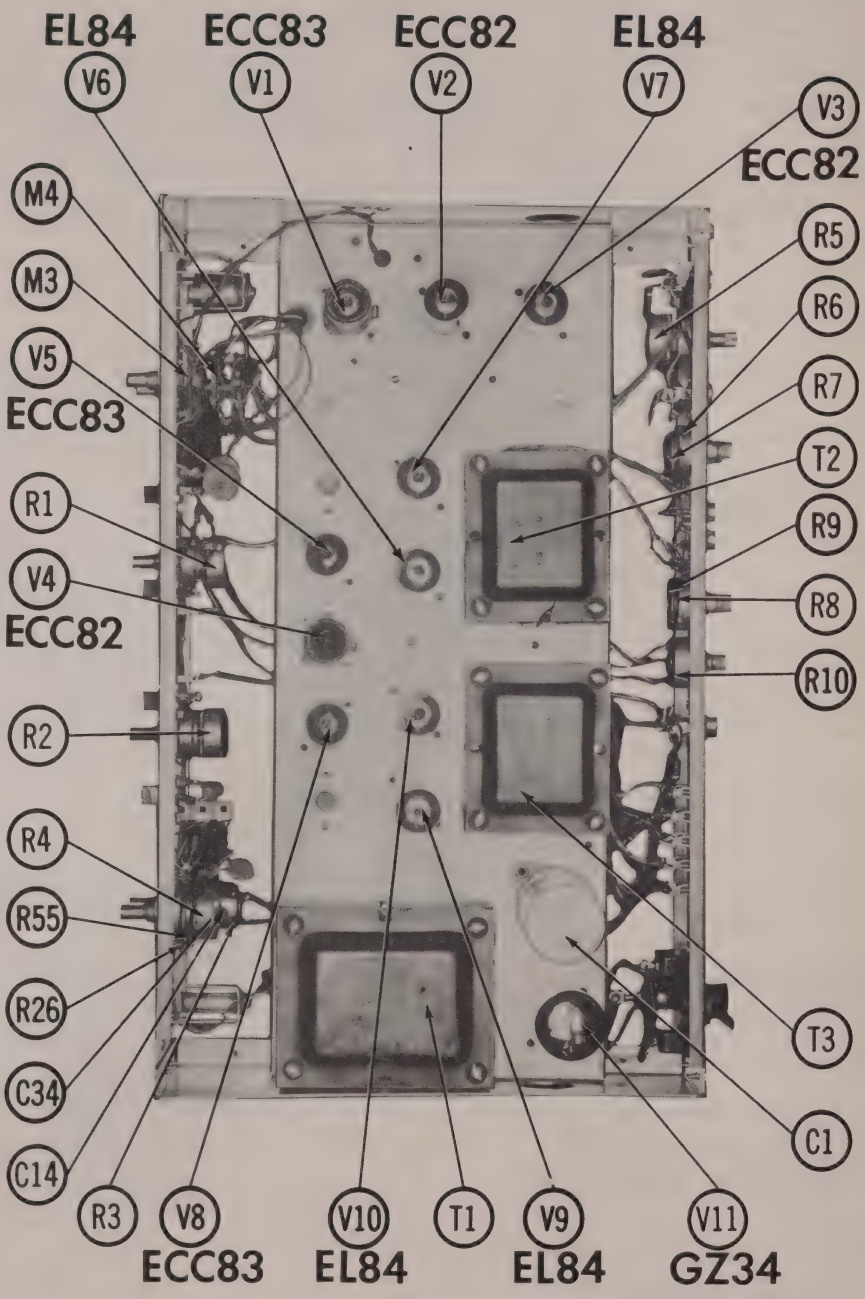
ARKAY MODEL CS-28



CHASSIS BOTTOM VIEW – CAPACITOR & MISC. IDENT.



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Channel A Preamp. - Channel B Preamp.	ECC83/12AX7
V2	Channel A AF Amp. - Channel B AF Amp.	ECC82/12AU7
V3	Channel A AF Amp. - Channel B AF Amp.	ECC82/12AU7
V4	Channel A AF Amp. - Channel B AF Amp.	ECC82/12AU7
V5	Channel A AF Amp. - Channel A Phase Inv.	ECC83/12AX7

ITEM No.	USE	TYPE
V6	Channel A Output	EL84 (6BQ5A) *
V7	Channel A Output	EL84 (6BQ5A) *
V8	Channel B AF Amp. - Channel B Phase Inv.	ECC83/12AX7
V9	Channel B Output	EL84 (6BQ5A) *
V10	Channel B Output	EL84 (6BQ5A) *
V11	Rectifier	GZ34/5AR4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	ARKAY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1A	▲40	450	1248	AFH4-15-30	BO450	FP238	TMD-2650	TVL-2764		
B	■40	450			BR4045	TC78	TD-40-450	TVA-1712		
C	▲40	450								
C2	10	450	1234	PRS1720	BR1045	TC72	TD-10-450	TVA-1705		
C3	10	450	1234	PRS1720	BR1045	TC72	TD-10-450	TVA-1705		
C4	100	25	1237	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207		

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C6	700		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C7	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C8	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C11	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C12	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C13	250	(270) †	DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C14	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C18	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C19	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C20	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C21	100 N750	Note 1	N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C22	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C23	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C24	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C25	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C26	700		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C27	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C28	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C29	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C30	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C31	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C32	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C33	250	(270) †	DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C34	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C35	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C38	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C39	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C40	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C41	100 N750	Note 1	N750-100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C42	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C43	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C44	47 N750		N750-47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C45	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

† Alternate Value.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARKAY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	250K	½	1612					Volume, Channel A
	75K Tap							
B	250K	½						Volume, Channel B
	75K Tap							
R2A	500K	½	1611	B-59	AD47-500K-S		FA55L	Balance, Channel A
B	500K	½		SR-59	Not Req.		RU55L	Balance, Channel B
C	Shaft			Not Req.	RS-2		CS3500	
R3A	2meg	½	169	B-76	AD47-2meg-Z		FA26A	Treble, Channel A
B	2meg	½		SR-76	Not Req.		RU26A	Treble, Channel B
C	Shaft			Not Req.	RS-2		CS3500	
D	Switch			KR-1	SWE-12		US41	Power On-Off
R4A	2meg	½	1613	B-76	AD47-2meg-Z		FA26A	Bass, Channel A
B	2meg	½		SR-76	Not Req.		RU26A	Bass, Channel B
C	Shaft			Not Req.	RS-2		CS3500	
R5A	100K	½	1614	B-40	AD47-100K-S		FB15L	Phono Level, Channel A
B	100K	½		SR-40	Not Req.		RU15L	Phono Level, Channel B
C	Shaft			Not Req.	KSS-3		CS3500	
R6A	1meg	½	1625	BX-69	A47-1meg-S	B11-137	SU-54	Aux. Level, Channel B
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	
R7A	1meg	½	1625	BX-69	A47-1meg-S	B11-137	SU-54	Tuner Level, Channel B
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	
R8A	1meg	½	1625	BX-69	A47-1meg-S	B11-137	SU-54	Aux. Level, Channel A
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	
R9A	1meg	½	1625	BX-69	A47-1meg-S	B11-137	SU-54	Tuner Level, Channel A
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	
R10A	100Ω	½	1627	AB-1		B11-084	U1	Hum Balance
B	Shaft			AK-1		SK6	Not Req.	
R11A	1meg	½	1625	BX-69	A47-1meg-S	B11-137	SU-54	AC Balance, Channel A
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	
R12A	1meg	½	1625	BX-69	A47-1meg-S	B11-137	SU-54	AC Balance, Channel B
B	Shaft			Not Req.	FKS-1/4	SK6	Not Req.	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R13	100K	
R14	1000Ω	
R15	560Ω	
R16	270K	
R17	1800Ω	
R18	43K	
R19	120K	
R20	1meg	
R21	270K	
R22	1meg	
R23	150K	
R24	1800Ω	
R25	220K	
R26	18K	
R27	27K	
R28	15K	

ITEM No.	RATING	REMARKS
R29	100K	
R30	3300Ω	
R31	1meg	
R32	470K	
R33	1800Ω	
R34	33K	
R35	3300Ω	
R36	100K	
R37	100K	
R38	1000Ω	
R39	1000Ω	
R40	250Ω 7W	IRC#PW10-250Ω
R41	100K	
R42	1000Ω	
R43	560Ω	
R44	270K	

ITEM No.	RATING	REMARKS
R45	1800Ω	
R46	43K	
R47	120K	
R48	1meg	
R49	270K	
R50	1meg	
R51	150K	
R52	1800Ω	
R53	47K	
R54	220K	
R55	18K	
R56	27K	
R57	15K	
R58	100K	
R59	3300Ω	
R60	10K 1W	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT) (cont)

ITEM No.	RATING	REMARKS
R61	1meg	
R62	470K	
R63	1800Ω	
R64	33K	

ITEM No.	RATING	REMARKS
R65	3300Ω	
R66	100K	
R67	100K	
R68	1000Ω	

ITEM No.	RATING	REMARKS
R69	1000Ω	
R70	2300Ω 7W	Pt. #10204 IRC#PW10-2300Ω
R71	22Ω 1W	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	ARKAY PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ 1.4A	650VCT @ .200A	5V @ 1.8A	55F4					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 3.3A	6.3V @ 1.5A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ARKAY PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6800Ω CT	32Ω Tap @ 16Ω, 8Ω, 4Ω	55F5					
T3	6800Ω CT	32Ω Tap @ 16Ω, 8Ω, 4Ω	55F5					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ARKAY PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 250V	1499	1457	312002 (3AG 2A 250V)	342001	AGC 2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	ARKAY PART No.	NOTES
M2	Switch	1534	Preamp. Out-In (DPST Slide Type)
M3	Switch	1647	Function Selector (Rotary Type)
M4	Switch	1646	Mode (Rotary Type)
M5	Switch	1534	Recorder, Out-In (DPST Slide Type)
M6	Switch	1534	Loudness, Out-In (DPST Slide Type)
M7	Switch	1534	Lo Filter, Out-In (DPST Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	1566	
Cabinet	5102	

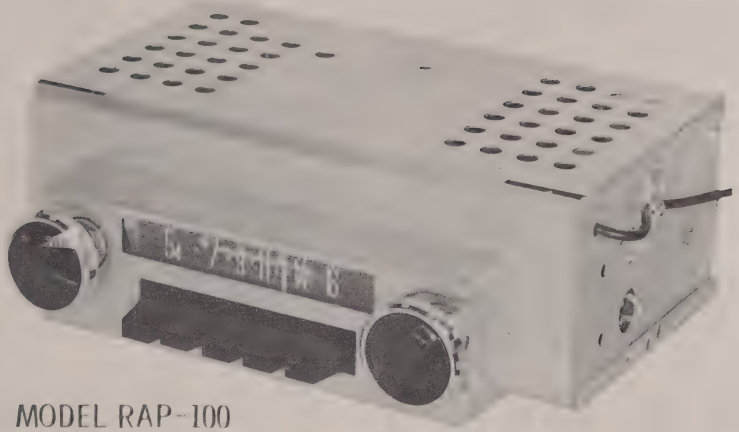
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

AUTOMATIC MODELS
RAP-100, RP-470



MODEL RAP-100

AUTOMATIC MODELS
RAP-100, RP-470

TRADE NAME	Automatic Models RAP-100, RP-470 (For 1960 Ramblers)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated 4 Tube - 2 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.4 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	538 – 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4...GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6.....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	265KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	Thru dummy (Fig. 1) to antenna receptacle.	"	1610KC Signal.	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

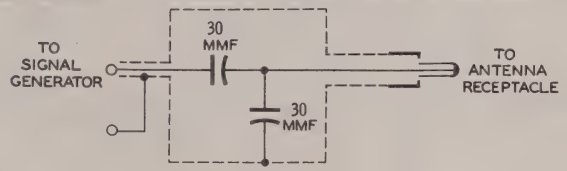


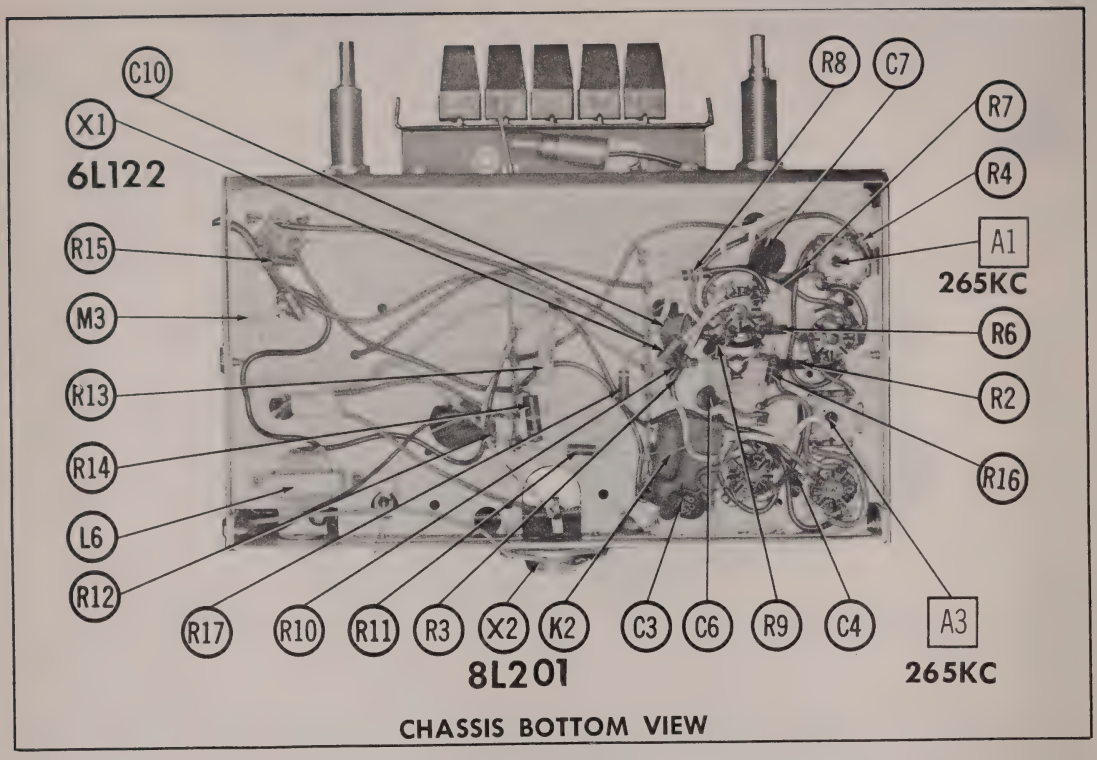
FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

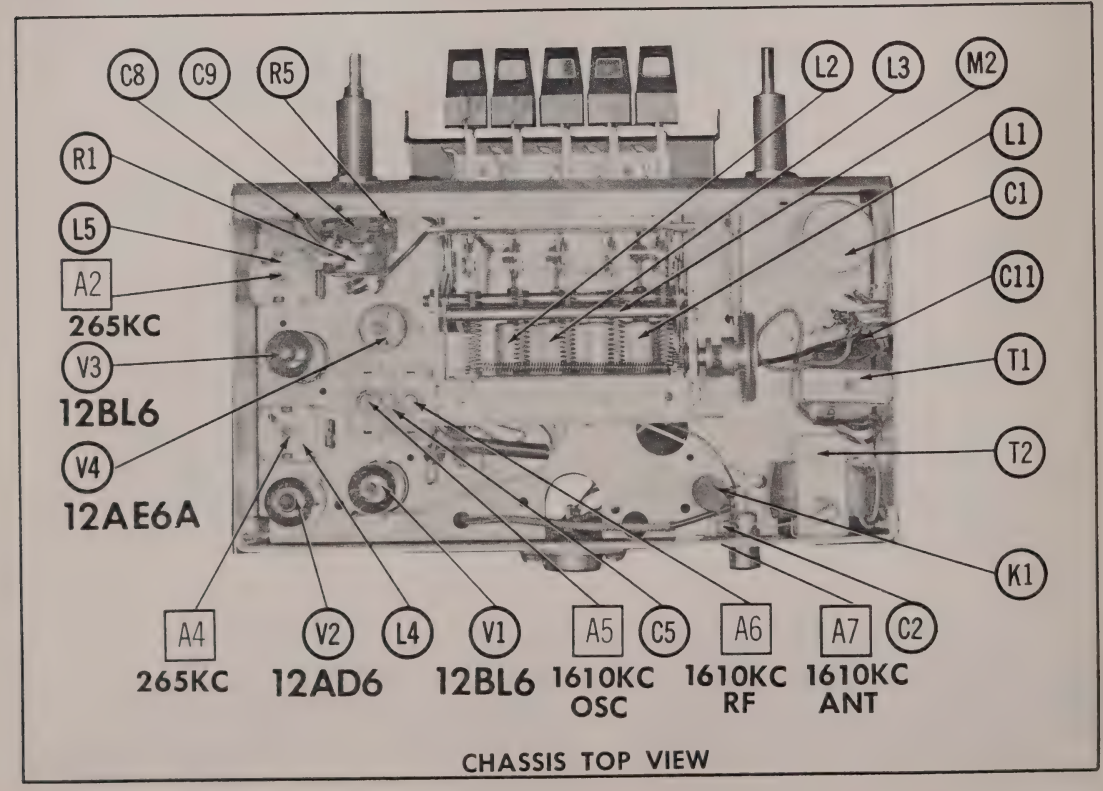
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD258

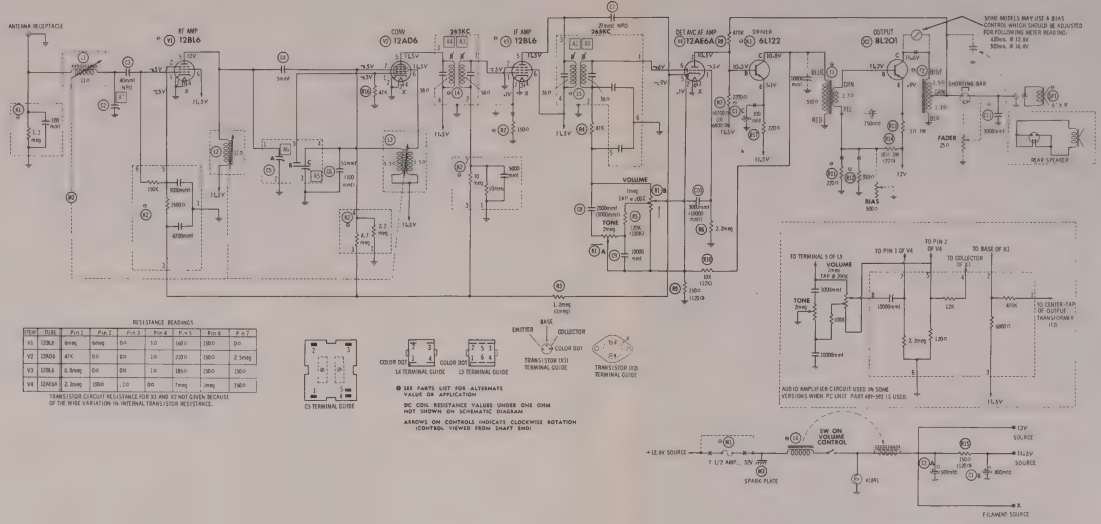
SET 511 FOLDER 5



CHASSIS BOTTOM VIEW



CHASSIS TOP VIEW



RESISTANCE READINGS

TUBE	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	6meg	6meg	0Ω	1Ω	160Ω	150Ω	0Ω
V2	12AD6	47K	0Ω	0Ω	1Ω	220Ω	150Ω	2.5meg
V3	12BL6	6.5meg	0Ω	0Ω	1Ω	185Ω	150Ω	150Ω
V4	12AB6A	2.5meg	180Ω	1Ω	0Ω	1meg	1meg	350Ω

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

L5 TERMINAL GUIDE

COLOR DOT L4 TERMINAL GUIDE

COLOR DOT L5 TERMINAL GUIDE

TRANSISTOR (X1) TERMINAL GUIDE

TRANSISTOR (X2) TERMINAL GUIDE

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

1 DC voltage measurements taken with vacuum tube voltmeter
2 Socket connections shown as bottom view.
3 Measured values are from socket pin to common ground.
4 Battery voltage maintained at 12.6 volts for voltage readings
5 Normal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6 Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AUTOMATIC MODELS RAP-100, RP-470

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V1	RF Amplifier	12BL6 (12AF6) *
V2	Converter	12AD6
V3	IF Amplifier	12BL6 (12AF6) *
V4	Det. -AVC-AF Amp.	12AE6A

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	6L122 *	Driver		2N363		PNP
X2	8L201	Output				PNP Note 1

* Alternate Type 6D122.
Note 1. When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■500	15	20-322	AFH3-00-95		WP300.85		TVLS-3026.8*	①
B	▲400	15							
C	100	15							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 500-500mfd@15V (Part #20-317) and 750mfd@3V (Part #20-757) in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2		#28-800L						
C3	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C4	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C5A, B, C		#28-4046						
C6	51	(100) †	DI-50	DTZ-50	L10Q50	CCTO-510	GP450	10TS-Q50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	27 NPO		NPO-DI 27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C8	2000	(3000) †	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	3000	(10000) †	BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C11	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30

\# Automatic Part Number.
† Alternate Value.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	1/2	80A1430	F1-68				Tone
B	1meg	1/2		R2-59				Volume
	200K Tap				RTV-718C *	† QJ-1299A	■ UE4158-8	
C	Shaft			AK-28				
D	Switch			KR-4				Power Off-On

† "CONCENTRIKIT" equivalent: K-8 Kit with base elements & shafts: Bl3-139, P14-118 (Panel); Bl3-137X, R1-130 (Rear); 823 (Bushing); 76-1 (Switch)
■ "STA-LOC" equivalent: FN26A, RU16T25, OS1500A, IS1937, US41.
* Use XB-1 Bushing.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	150Ω	Note 1
R3	1.2meg	(1meg)
R4	47K	
R5	120K	(100K) *
R6	2.2meg	
R7	2200Ω	(4700Ω, 6800Ω) *

ITEM No.	RATING	REMARKS
R8	470K	
R9	150Ω	(120Ω) *
R10	10K	(12K) *
R11	220Ω	Note 2
R12	330Ω	Note 2
R13	0.1Ω 1W	

ITEM No.	RATING	REMARKS
R14	10Ω 1W	(22Ω) *
R15	150Ω	(120Ω) *
R16	47K	
R17	220Ω	

* Alternate Value.
Note 1. Not used in some versions.
Note 2. Some versions may use a 500Ω control in this application (Part #62-501).

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg	89-4204 (Note 1)	Sprague PRC-9
K2	RF, IF Comp.	3000mmf, 5000mmf, 47000mmf, 150Ω, 150K, 2.2meg, 4.7meg, 10meg, 10meg	89-591 (Note 1)	Sprague DT-14

Note 1. Some versions may use Individual Components in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		AUTOMATIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Ant. Coil	①				① Part of Tuner Assembly M2.
L2	RF Coil	①				② Alternate Part #14-265X.
L3	Osc. Coil	①				③ Alternate Part #14-267X.
L4	Input IF Trans.	14-265A ②	BC-350	12-H1	RTC-8638	
L5	Output IF Trans.	14-267A ③	BC-354	12-H6	RTC-8640	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	AUTOMATIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L6	1.4A	.6Ω	.009 HY	75-6001①					Alternate Part # 75A601.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	7	1	75A1436①					① Alternate Part #75A1303.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA					NOTES
	PRI.	AUTOMATIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	24Ω Tap @ 3-4Ω	75A1437①					① Alternate Part #75A1306.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	73-905 •	69A3	• Alternate Part #73-92.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V			30707.5 (SFE 7½A 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M2 M3	Tuner Spark Plate	78B1431	Complete (Pushbutton Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48A889	Tuning, Volume
Knob	48A648	Tone, Dummy

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire .....Use BELDEN No. 8885
Bonding Strap .....Use BELDEN No. 8661

PHOTOFACT® Folder

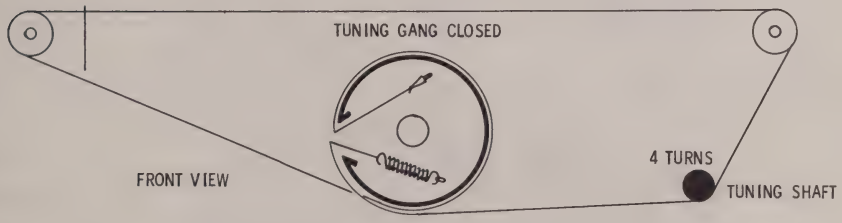
**CHANNEL MASTER
MODEL 6610**

CHANNEL MASTER
MODEL 6610

CHANNEL MASTER
MODEL 6610

TRADE NAME	Channel Master Model 6610
MANUFACTURER	Channel Master Corp., Ellenville, N. Y.
TYPE SET	AC Operated 7 Tube FM-AM Tuner
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 25 Watts, .25 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC FREQ. MOD. 88 – 108MC

DIAL CORD STRINGING



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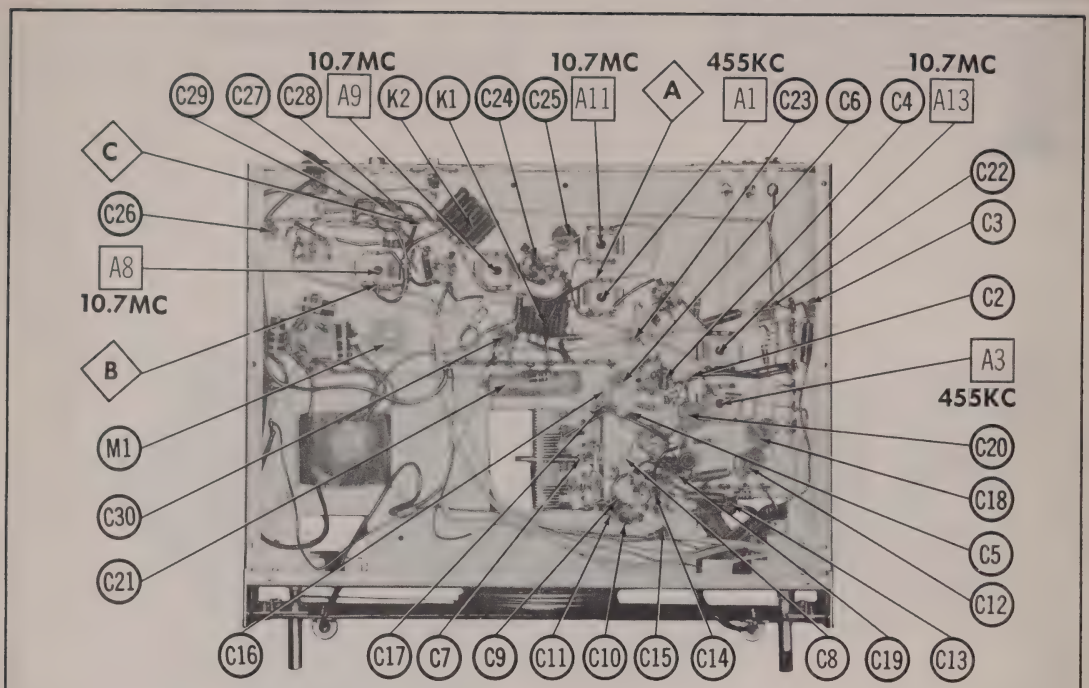
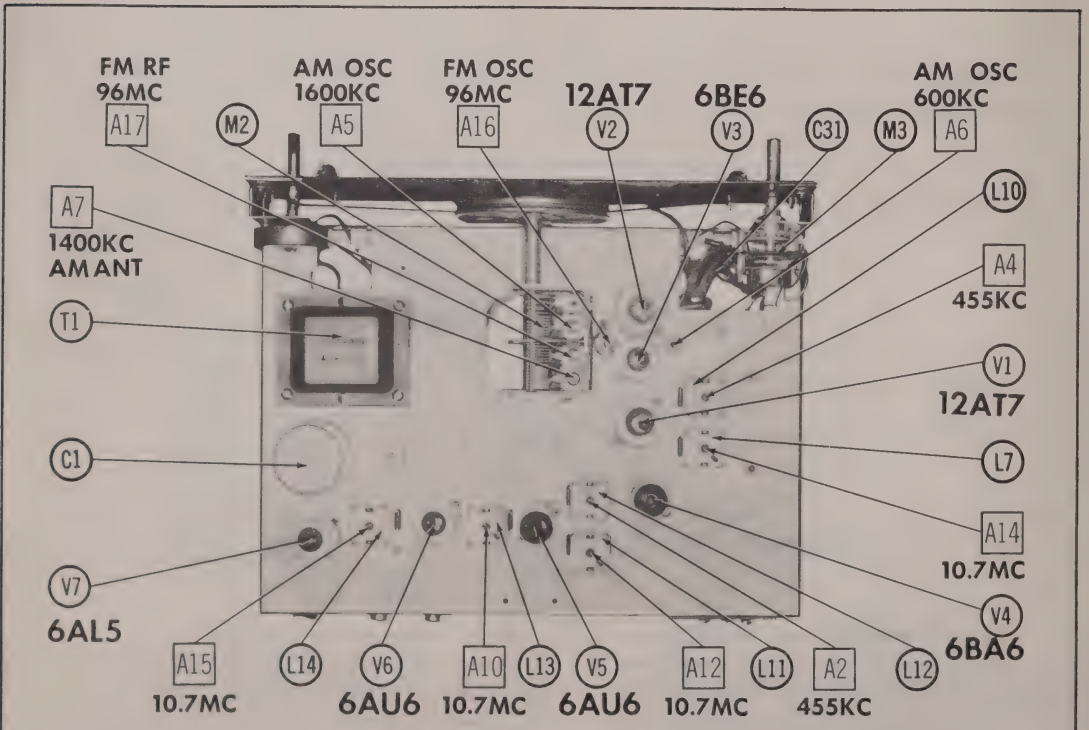
SET 511 FOLDER 6



CHASSIS BOTTOM VIEW – ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS – TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Une only enough generator output to provide a usable indication.

Suggested Alignment Tools:
A1 thru A4, A8 thru A15...GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A7, A16, A17..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	1600KC	1600KC	"	A5	"
3.	"	600KC	600KC	"	A6	"
4.	Loop	1400KC	1400KC Signal.	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat Steps 2, 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe thru 1meg to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtain on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. thru 47K to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	High side thru 270Ω to FM antenna terminal. Low side to chassis.	96MC (Unmod.)	(FM) 96MC	DC probe thru 1meg to point Ⓑ. Common to chassis.	A16, A17	Adjust for maximum deflection.

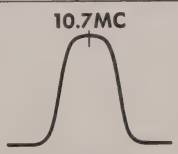


FIG. 1

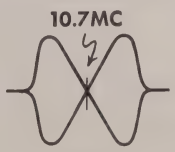
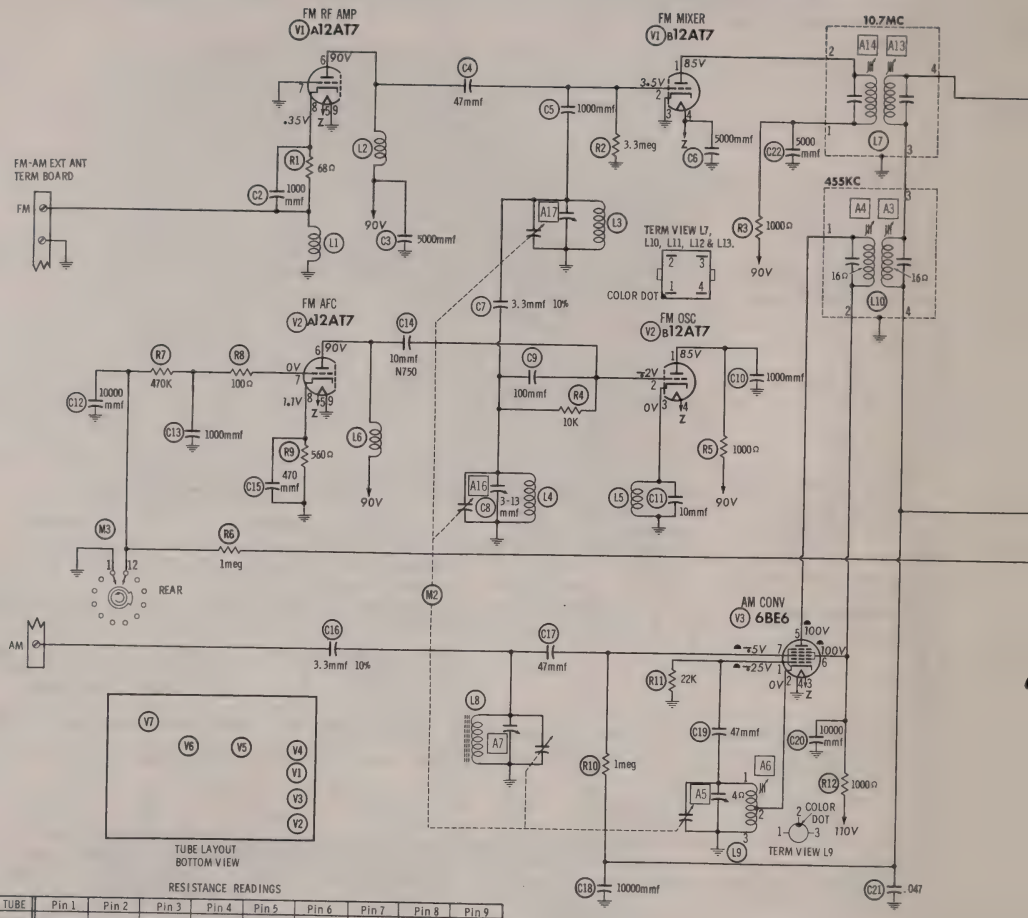


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†2500Ω	3.3meg	0Ω	.1Ω	.1Ω	†1500Ω	0Ω	68Ω	0Ω
V2	12AT7	†2500Ω	10K	0Ω	.1Ω	.1Ω	†1500Ω	1.7meg ▪470K	560Ω	0Ω
V3	6BE6	22K	0Ω	.1Ω	0Ω	▪†2500Ω	▪†2500Ω	2.5meg		
V4	6BA6	1.5meg	0Ω	.1Ω	0Ω	†2500Ω	†2500Ω	68Ω		
V5	6AU6	520K	0Ω	.1Ω	0Ω	†2500Ω	†2500Ω	0Ω		
V6	6AU6	100K	0Ω	0Ω	.1Ω	†23K	†23K	0Ω		
V7	6AL5	0Ω	100K	.1Ω	0Ω	200K	NC	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
MEASURED IN "AM" POSITION.
MEASURED WITH "AFC" OFF.
† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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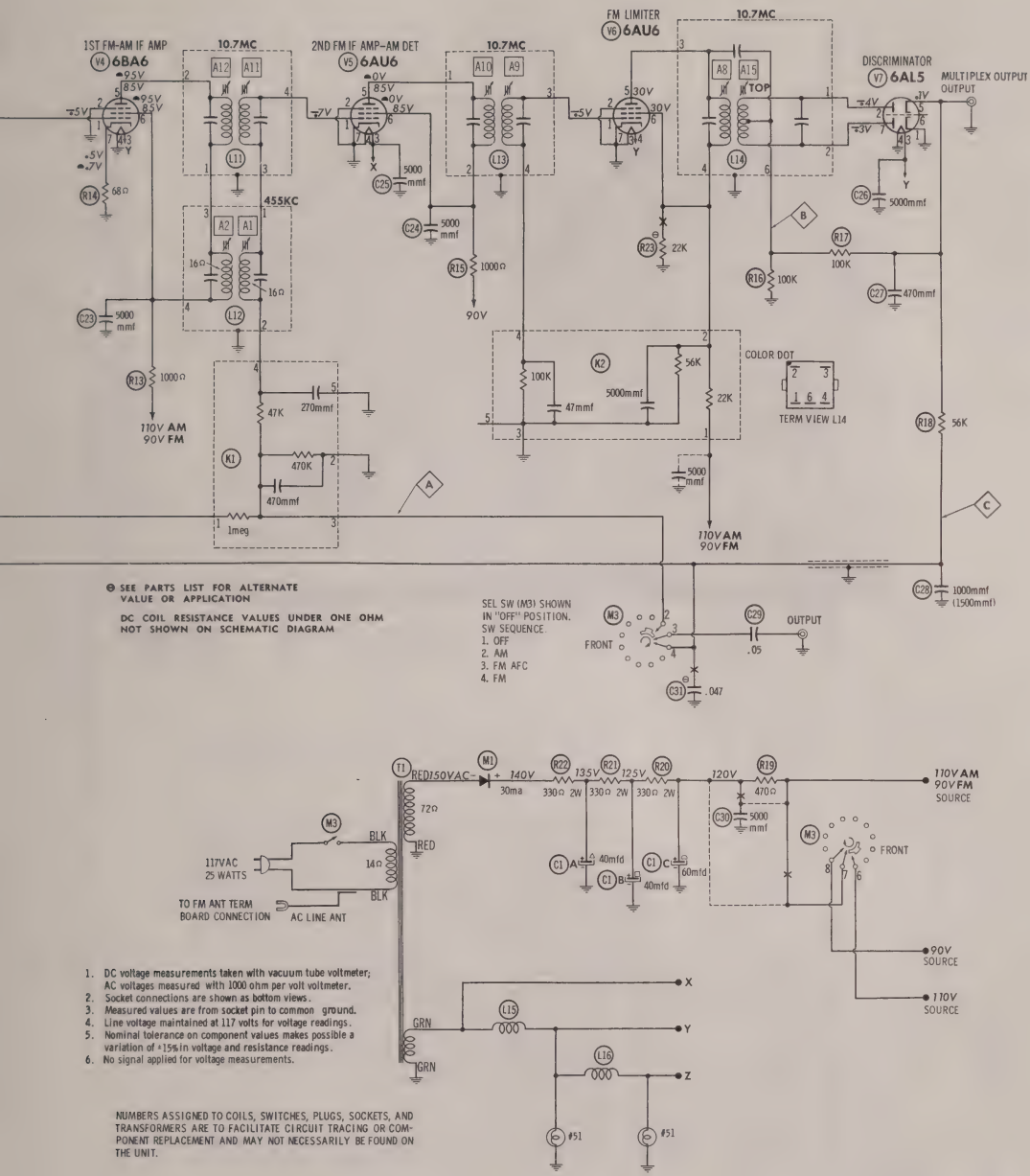


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. No signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

CHANNEL MASTER
MODEL 6610

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •		RAYTHEON •	SYLVANIA •	
V1	FM RF Amp. -FM Mixer	12AT7	V5	2nd FM IF Amp. -AM Det.	6AU6
V2	FM Osc. -FM AFC	12AT7	V6	FM Limiter	6AU6
V3	AM Converter	6BE6	V7	Discriminator	6AL5
V4	1st FM-AM IF Amp.	6BA6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Channel Master PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	150	A523	AFH3-101-20	XC0613	FP311.68	TMD-2205	TVL-3443.2	
B	■40	150			BR4015		TD-40-150		
C	▲60	150							

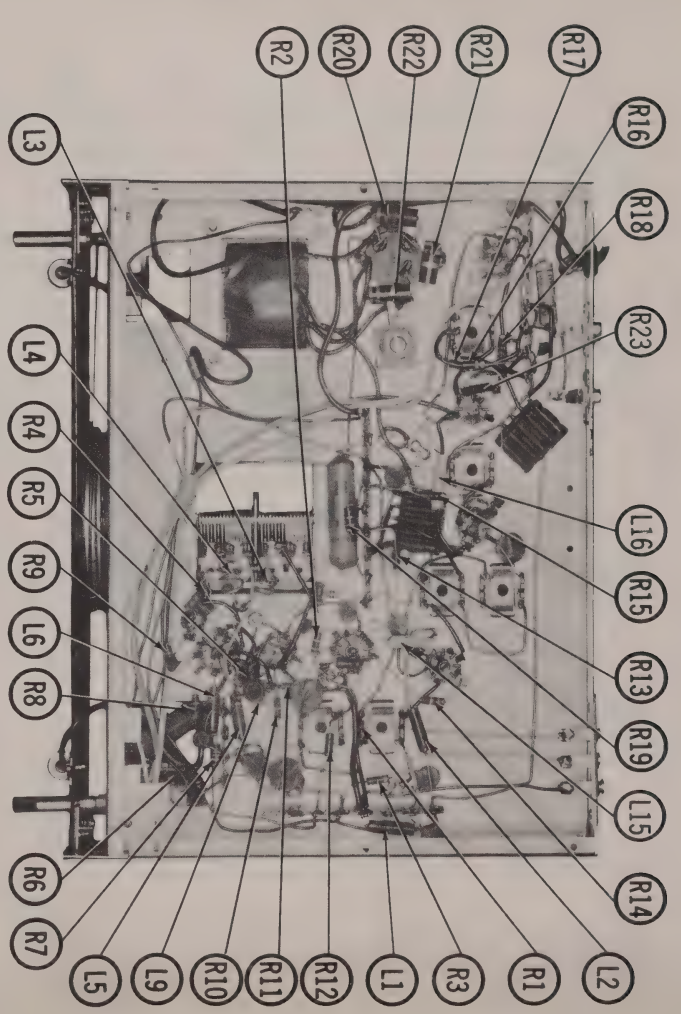
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C3	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C4	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	3.3 10%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C8	3-13	#A532						
C9	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	10 N750		N750-DI 10	DTN-10	C10Q10U	CCTN-100	CN7-410	10TCU-Q10
C15	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C16	3.3 10%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C17	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C23	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C26	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C27	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C28	1000	(1500) †	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C29	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C31	.047 200V	Note 1	P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47

Channel Master Part Number.
† Alternate Value.
Note 1. Not used in some versions.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	68Ω	
R2	3.3meg	
R3	1000Ω	
R4	10K	
R5	1000Ω	
R6	1meg	
R7	470K	
R8	100Ω	

ITEM No.	RATING	REMARKS
R9	560Ω	
R10	1meg	
R11	22K	
R12	1000Ω	
R13	1000Ω	
R14	68Ω	
R15	1000Ω	
R16	100K	

ITEM No.	RATING	REMARKS
R17	100K	
R18	56K	
R19	470Ω	
R20	330Ω 2W	
R21	330Ω 2W	
R22	330Ω 2W	
R23	22K	Note 1

Note 1. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Channel Master PART No.	REPLACEMENT DATA
K1	AM Diode Filter	470mmf, 270mmf, 47K, 470K, 1meg	F538	
K2	FM Limiter Coupling	470mmf, 5000mmf, 22K, 56K, 100K	F539	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Channel Master PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	FM Ant. Coil	C512	BC-561	4602	RTC-8515	1uh
L2	RF Choke	C514	BC-564	4608	RTC-8518	3.3uh
L3	FM RF Coil	C511				
L4	FM Osc. Coil	C510				
L5	Cathode Choke	C512	BC-561	4602	RTC-8515	1uh
L6	RF Choke	C513	BC-563	4606	RTC-8517	2.2uh
L7	1st FM IF Trans.	C505	FM-254	1463	RTC-8599	
L8	Loopstick	C508	BC-419	705-A		
L9	AM Osc. Coil	C509	BC-393	70-OSC	RTC-8647	
L10	1st AM IF Trans.	C507	BC-352	12-C1	RTC-8632	
L11	2nd FM IF Trans.	C505	FM-254	1463	RTC-8599	
L12	2nd AM IF Trans.	C507	BC-353	12-C2	RTC-8633	
L13	3rd FM IF Trans.	C505	FM-254	1463	RTC-8599	
L14	Discriminator	C506	FM-253	1464	RTC-8665	
L15	Fil. Choke	C515	BC-562	4604	RTC-8516	1.5uh
L16	Fil. Choke	C515	BC-562	4604	RTC-8516	1.5uh

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Channel Master PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ .25A	150V@ .030A DC	6.3V@ 2.4A	C-504					

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Channel Master PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.030A	F-549 *		1N1763 ♦	65A *	SR200 ♦	* Selenium Type ♦ Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	Channel Master PART No.	NOTES
M2	Tuning Cap.	A-531	2 Gang (Ant. 12-425mmf, Osc. 15-135mmf)
M3	Switch	E-515	Selector, Includes Off-On (Rotary Wafer Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	F534	
Dial Pointer	F535	
Knob	F511	Tuning, Selector

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

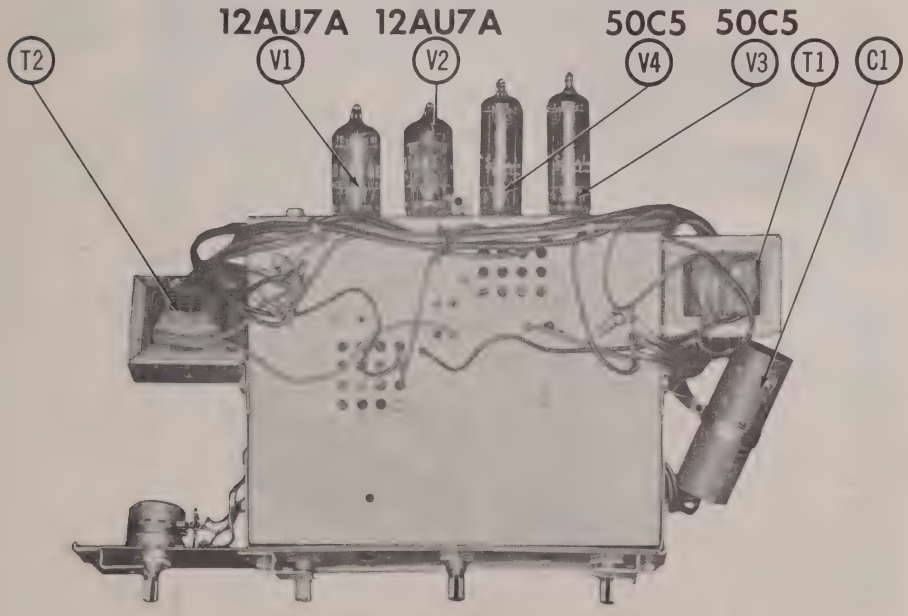
DECCA
MODEL DP-295

DECCA
MODEL DP-295

TRADE NAME	Decca Model DP-295
MANUFACTURER	Decca Distributing Corp., 445 Park Ave., New York 22, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 30 Watts, .31 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436
FOLDER 18 OR RECORD CHANGER MANUAL RC-12

DECCA
MODEL DP-295



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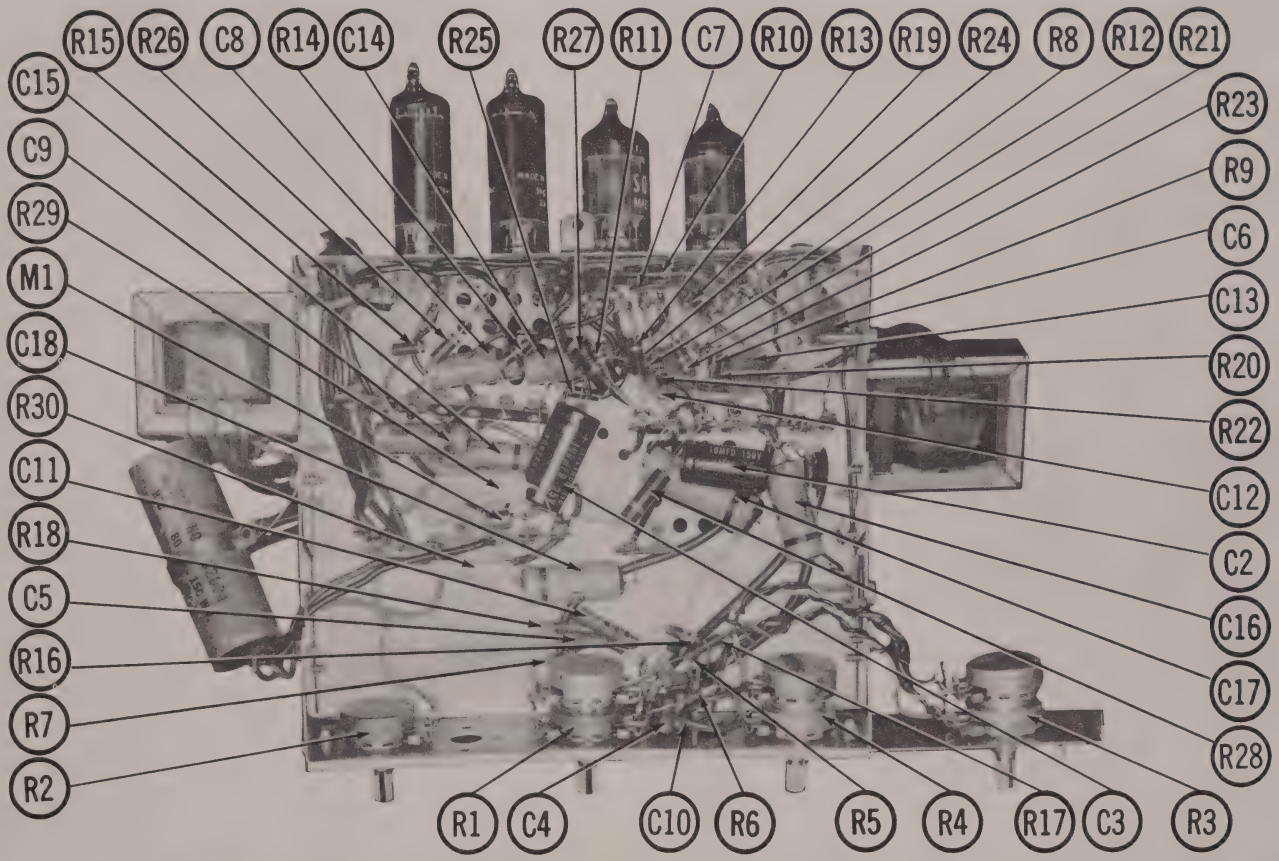


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A
V3	Left Channel Output	50C5
V4	Right Channel Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DECCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PRS2240	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	10	150		PRS1410	BBR10-150	TC42	TD-10-150	TVA-1406	
C3	100	25		PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	680		1468-00068	DD-681	5W5T68	CM-19B-681M	MCJ244	1FM-368
C5	3000		SI 3000	D6-302	BYA10D3	CCD-302	GP230	10TS-D30
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C9	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C10	680		1468-00068	DD-681	5W5T68	CM-19B-681M	MCJ244	1FM-368
C11	3000		SI 3000	D6-302	BYA10D3	CCD-302	GP230	10TS-D30
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C15	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C16	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C18	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DECCA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	*3.25meg		368037					Loudness, Left Channel
B	*3.25meg							Loudness, Right Channel
R2A	250K		368057	B-50	A47-250K-S	Q11-130	U46	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	5meg		368036	B-88	AD47-5meg-S		FA56A	Bass, Left Channel
B	5meg			SR-88	Not Req.		RU56A	Bass, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	250K		368035	B-50	AD47-250K-S		FA254L	Treble, Left Channel
B	250K			SR-50	Not Req.		RU254L	Treble, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	

* Taps @ 1meg & 2meg.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100K	
R6	220K	
R7	100K	
R8	6.8meg	
R9	100K	
R10	220K	Note 1
R11	470K	
R12	100K	
R13	2200Ω	
R14	10K	
R15	2200Ω	
R16	100K	
R17	220K	
R18	100K	
R19	6.8meg	
R20	100K	
R21	220K	Note 1
R22	470K	
R23	100K	
R24	2200Ω	
R25	10K	
R26	2200Ω	
R27	75Ω	(82Ω) *
R28	2200Ω 1W	
R29	200Ω 5W	(47Ω) * IRC #PW5-200Ω
R30	200Ω 5W	Note 1 IRC #PW5-200Ω

Note 1. Not used in all versions.
* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA DECCA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	7800Ω	6-8Ω CT	430563					
		SEC. 2						
		24Ω						
	PRI.	SEC. 1						
T2	7800Ω	6-8Ω CT	430563					
		SEC. 2						
		24Ω						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA DECCA PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	406003	6A21	
SP2	6"	PM	3-4Ω	406003	6A21	
SP3	6"	PM	3-4Ω	406003	6A21	
SP4	6"	PM	3-4Ω	406003	6A21	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA DECCA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.075A	*		1N1763 *	30H *	SR200 *	* Silicon Type

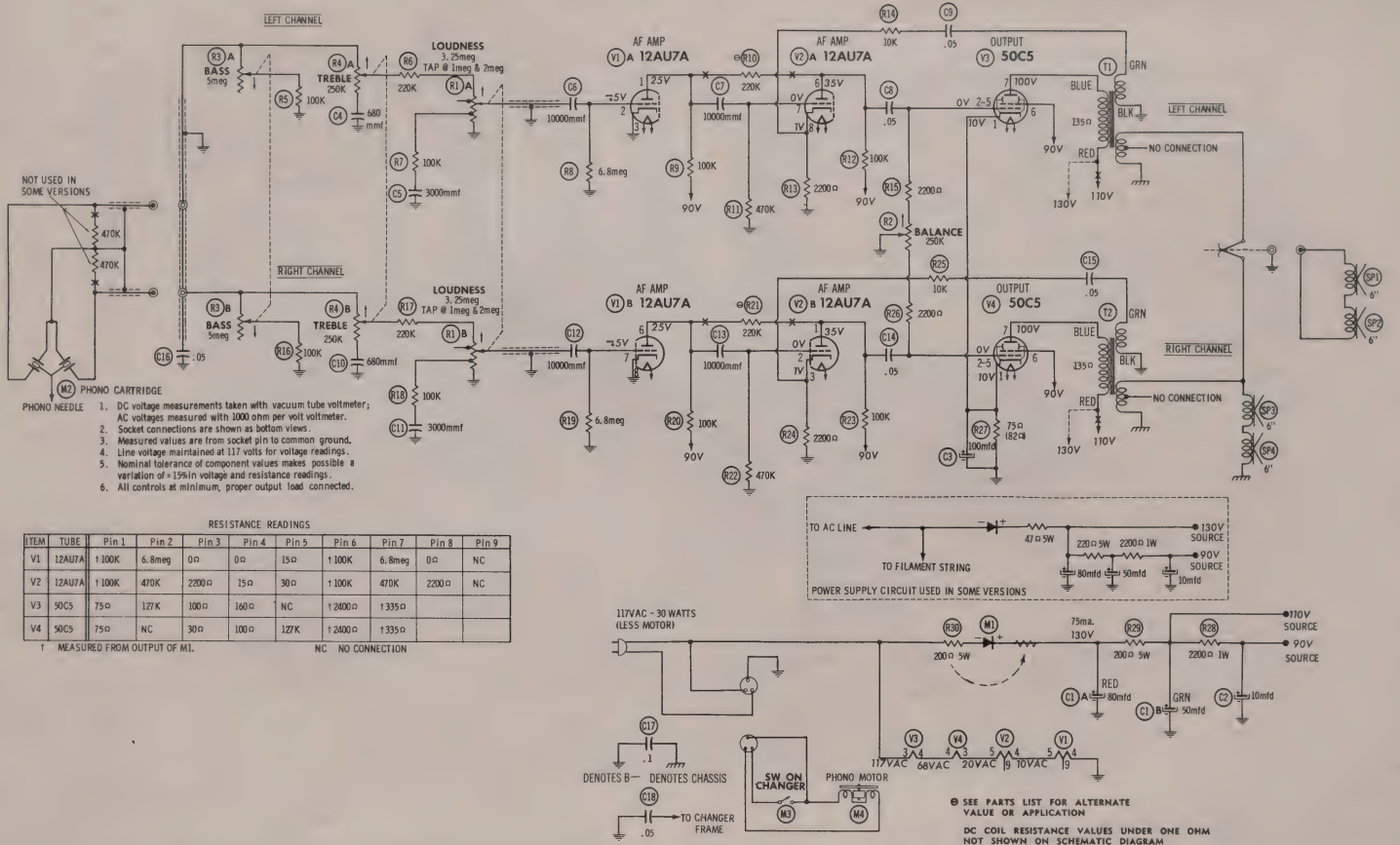
PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	DECCA PART No. CARTRIDGE	DECCA PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2			13TB		26S	S1-1 * and S3-3 *	8TA4-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	DECCA PART No.	NOTES
M3	Switch		Off-On (Part of Changer)
M4	Motor		Phono Drive (Part of Changer)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	†100K	6.8meg	0Ω	0Ω	15Ω	†100K	6.8meg	0Ω	NC
V2	12AU7A	†100K	470K	2200Ω	15Ω	30Ω	†100K	470K	2200Ω	NC
V3	50C5	75Ω	127K	100Ω	160Ω	NC	†2400Ω	†335Ω		
V4	50C5	75Ω	NC	30Ω	100Ω	127K	†2400Ω	†335Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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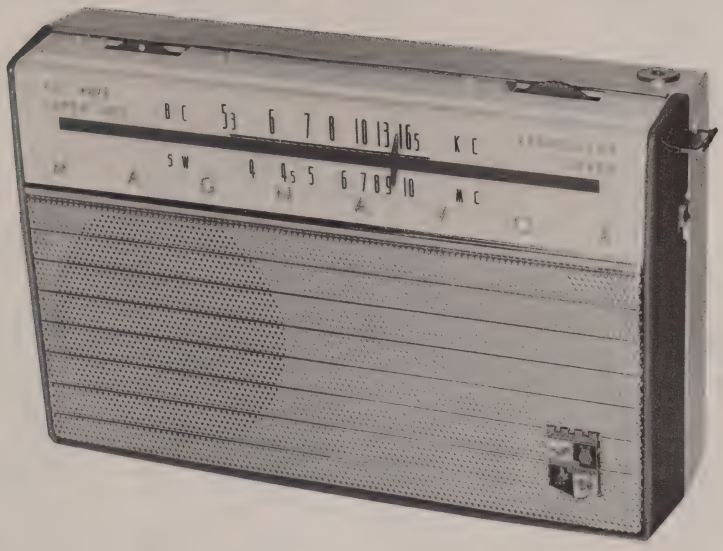
DECCA
MODEL DP-295

PHOTOFACT® Folder with CIRCUITRACE®

MAGNAVOX MODEL AW-24

MAGNAVOX MODEL AW-24



MAGNAVOX MODEL AW-24

TRADE NAME	Magnavox Model AW-24		
MANUFACTURER	The Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana		
TYPE SET	Battery Operated Transistorized Portable BC-SW Receiver		
POWER SUPPLY	6 Volts DC	RATING	10MA @ 6 Volts DC (No Signal, Min. Volume) 20MA @ 6 Volts DC (Signal, Normal Volume)
TUNING RANGE	BROADCAST 535-1650KC	SHORT WAVE	3.8-10.5MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1, A2, A3, A4, A6, A7 .... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

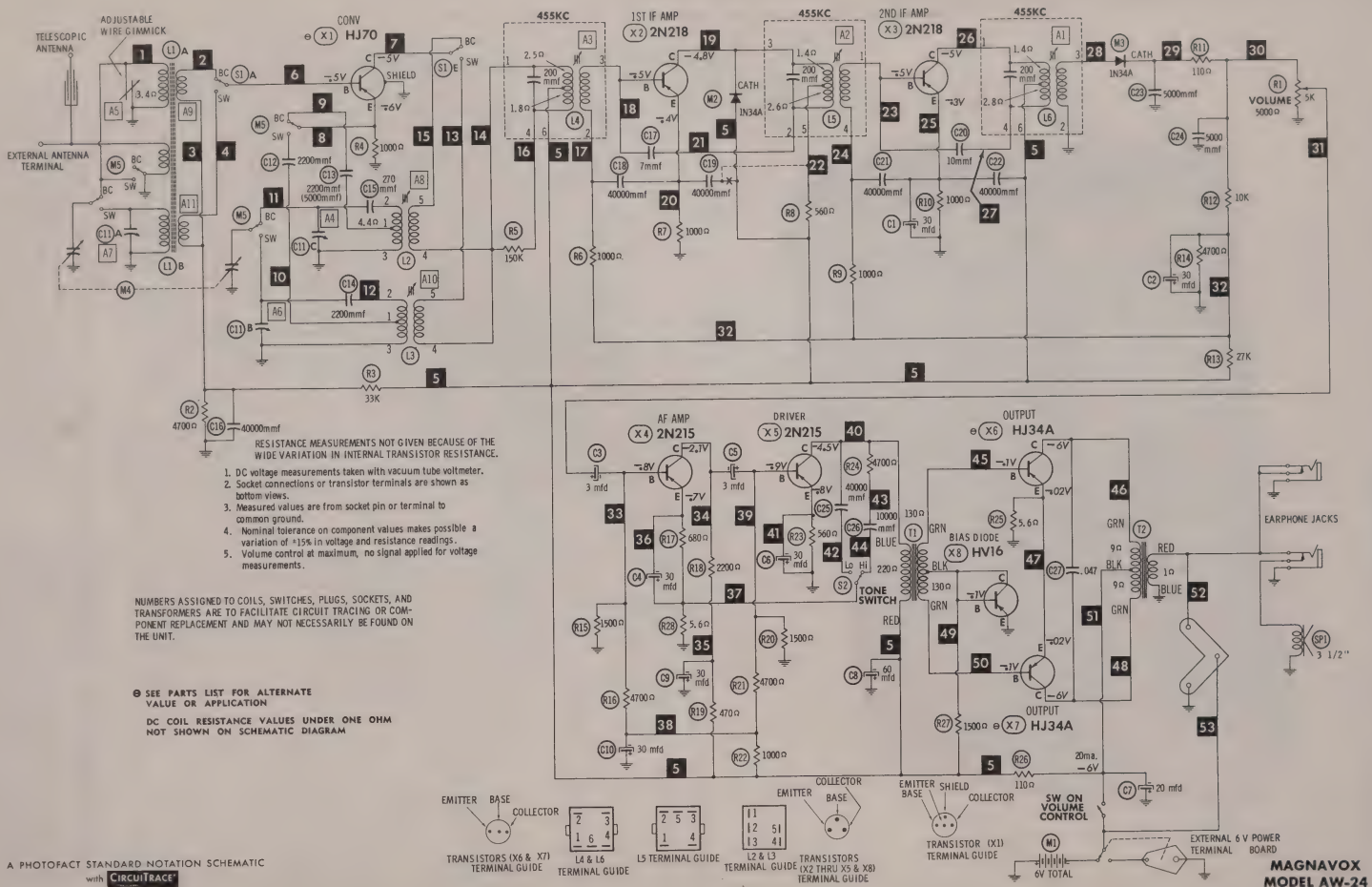
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to base of Converter. Low side to chassis.	455KC (400∿ Mod.)	(BC) Tuning gang fully open.	Across Voice Coil	A1, A2, A3	Adjust for maximum output.
2.	High side thru 270Ω to external antenna terminal. Low side to chassis.	1400KC	(BC) 1400KC	"	A4, A5	"
3.	"	9MC	(SW) 9MC	"	A6, A7	"
4.	"	600KC	(BC) 600KC	"	A8, A9	"
5.	"	4.2MC	(SW) 4.2MC	"	A10, A11	Adjust for maximum output. Repeat steps 2 thru 5.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT263

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 511 FOLDER 8



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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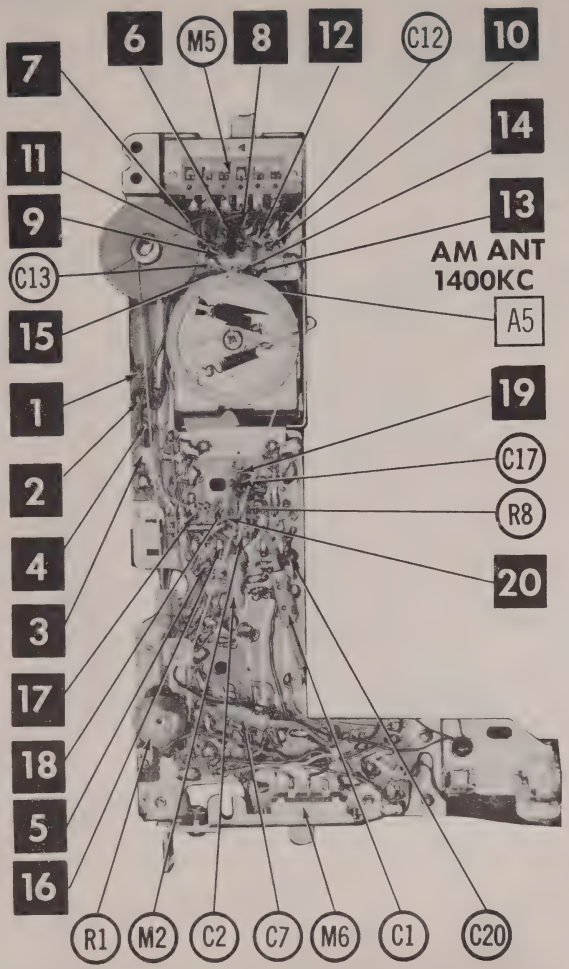
MAGNAVOX MODEL AW-24



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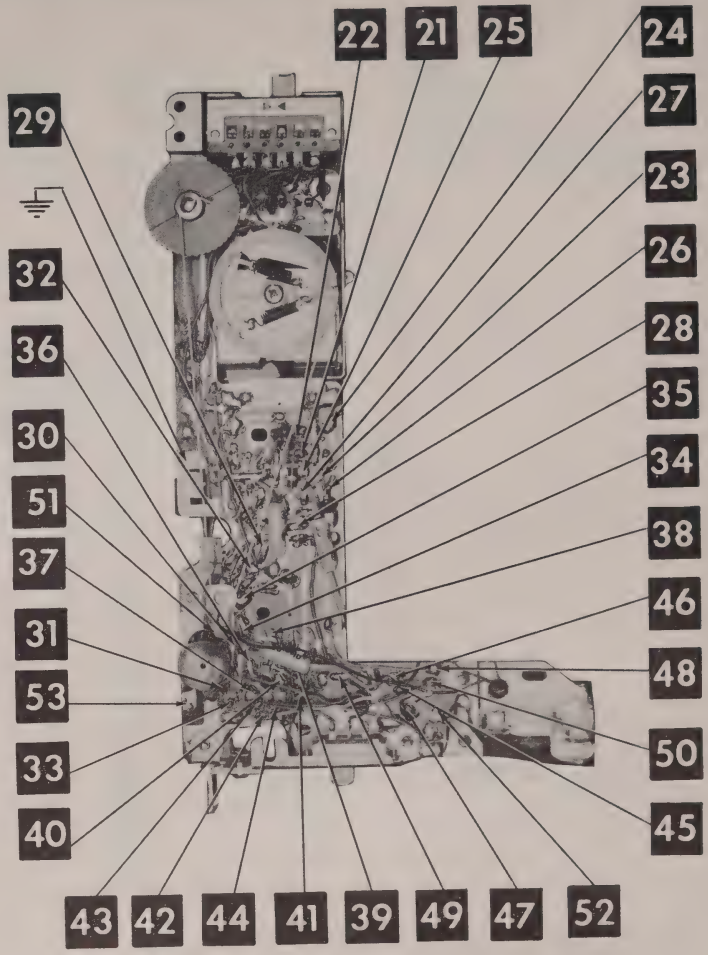
PRINTED BOARD



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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	HJ-70 *	Converter	2N370		2N370	PNP
X2	2N218	1st IF Amplifier	2N218	2N483	2N218	PNP
X3	2N218	2nd IF Amplifier	2N218	2N483	2N218	PNP
X4	2N215	AF Amplifier	2N407	2N362	2N104	PNP
X5	2N215	Driver	2N407	2N362	2N104	PNP
X6	HJ-34A †	Output	2N270	2N361	2N270	PNP
X7	HJ-34A †	Output	2N270	2N361	2N270	PNP
X8	HV-16	Bias Diode	1N2326	CK879		

* Alternate Type 2N370.
† Alternate Type 2N270.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	6	270044-1	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C2	30	6	270044-1	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C3	3	6	270045-1	XPP-6003	NLW3-6	TT6X3	ML4-6	TE-1082	
C4	30	6	270044-1	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C5	3	6	270045-1	XPP-6003	NLW3-6	TT6X3	ML4-6	TE-1082	
C6	30	6	270044-1	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C7	20	10	270047-1	XPP-10020	NLW20-15	TT15X20	ML20-15	TE-1130	
C8	60	10	270046-1	XPP-10050	NLW50-10	TT10X60	ML50-15	TE-1133	
C9	30	6	270044-1	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C10	30	6	270044-1	XPP-6030	NLW30-6	TT6X30	ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C11A B C		#260156-1						
C12	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	10TS-D22
C13	2200	(5000) †	BPD-0022	DD-222	BYA10D22	CCD-222	GP222	10TS-D22
C14	2200	#250341-1	1467-0022		1W5D22	CM-20D-222M	MCE459	1FM-222
C15	270		SI 270	D6-270	L10T27	CCD-271	GP327	10TS-T27
C16	40000			DD-403	BYB6S4		GP140	10TS-S40
C17	7		NPO-SI 6.8	TCZ-6R8	L10V68	CCTO-6R8	GP568	10TS-V68
C18	40000			DD-403	BYB6S4		GP140	10TS-S40
C19	40000			DD-403	BYB6S4		GP140	10TS-S40
C20	10		SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C21	40000			DD-403	BYB6S4		GP140	10TS-S40

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C22	40000			DD-403	BYB6S4		GP140	10TS-S40
C23	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	10TS-D50
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	10TS-D50
C25	40000			DD-403	BYB6S4		GP140	10TS-S40
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	10TS-S10
C27	.047 400V		V84C4S47	DD-503	WMF4S47E	4DP-3-473	GEM-4147	4TM-S47

† Alternate Value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10	220160-1					Volume and Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4700Ω	
R3	33K	
R4	1000Ω	
R5	150K	
R6	1000Ω	
R7	1000Ω	
R8	560Ω	
R9	1000Ω	
R10	1000Ω	

ITEM No.	RATING	REMARKS
R11	110Ω	
R12	10K	
R13	27K	
R14	4700Ω	
R15	1500Ω	
R16	4700Ω	
R17	680Ω	
R18	2200Ω	
R19	470Ω	

ITEM No.	RATING	REMARKS
R20	1500Ω	
R21	4700Ω	
R22	1000Ω	
R23	560Ω	
R24	4700Ω	
R25	5.6Ω	
R26	110Ω	
R27	1500Ω	
R28	5.6Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MAGNAVOX PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1A B	BC Loopstick SW Loopstick	360822-1				
L2	BC Osc. Coil	360824-1				
L3	SW Osc. Coil	360823-1				
L4	1st IF Trans.	360819-1				
L5	2nd IF Trans.	360820-1				
L6	3rd IF Trans.	360821-1				

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2	1	320086-1					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	340Ω CT	8-10Ω	320087-1					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	3½"	PM	8-10Ω	580061-1	3A07Z9	

BATTERIES

ITEM No.	VOLTAGE	MAGNAVOX PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1½V			230 *		A100 *		M-13R *	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N34A		1N34A	1N34A	Overload & AVC (Pigtail)
M3	1N34A		1N34A	1N34A	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Tuning Cap.	260155-1	2 Gang
M5	Switch	160329-1	Band Selector (Slide Type)
M6	Switch	160330-1	Tone (DPDT Slide Type)
	Antenna	700851-1	Telescoping
	Printed Board	210062-1	Less All Components

CABINETS & CABINET PARTS

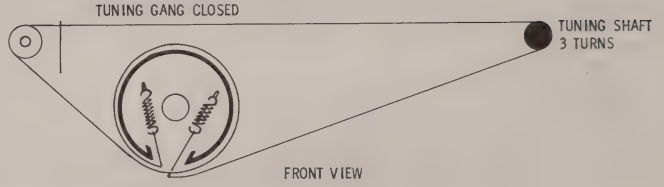
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

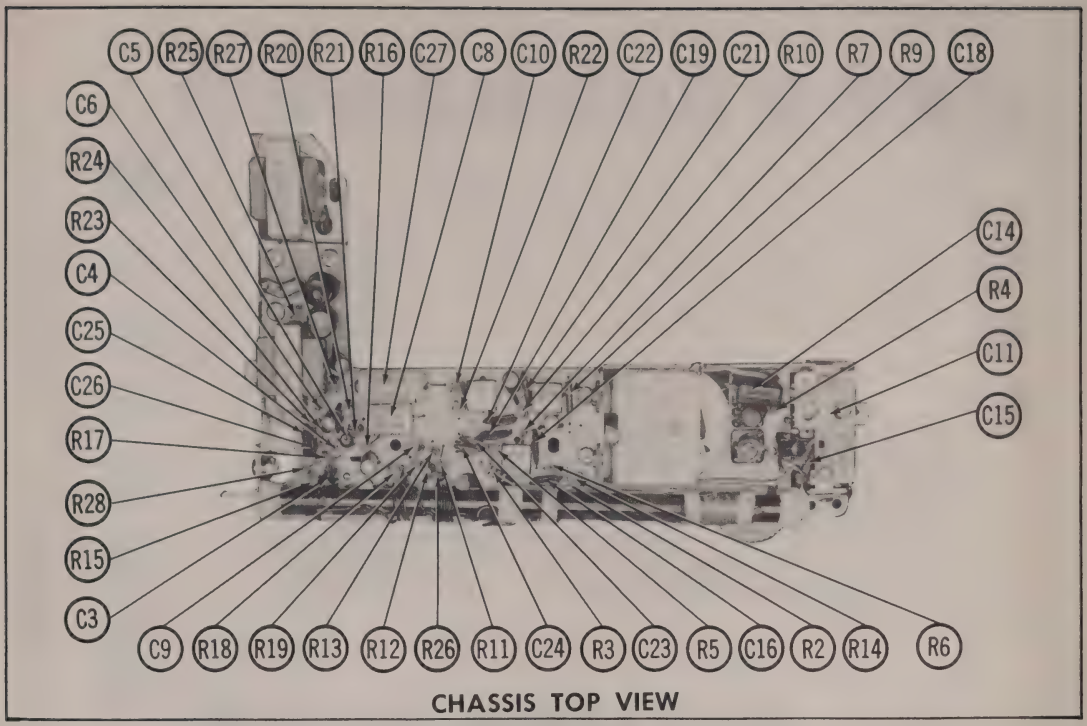
NAME	PART NO.	DESCRIPTION
Dial Scale	140385-1	
Knob	140383-1	Tuning
Knob	140384-1	Volume
Cabinet	140386-1	With Back
Back	140407-1	Cabinet
Case	400300-1	Leather, Carrying

WIRING DATA

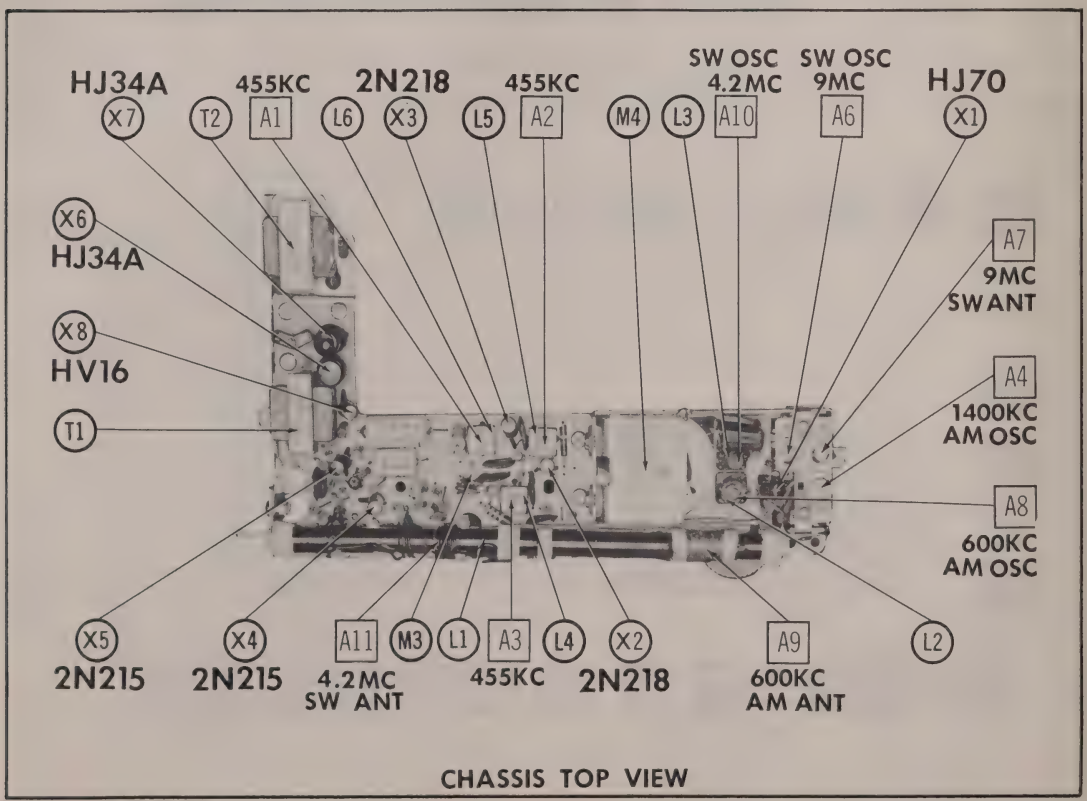
General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

DIAL CORD STRINGING





CHASSIS TOP VIEW

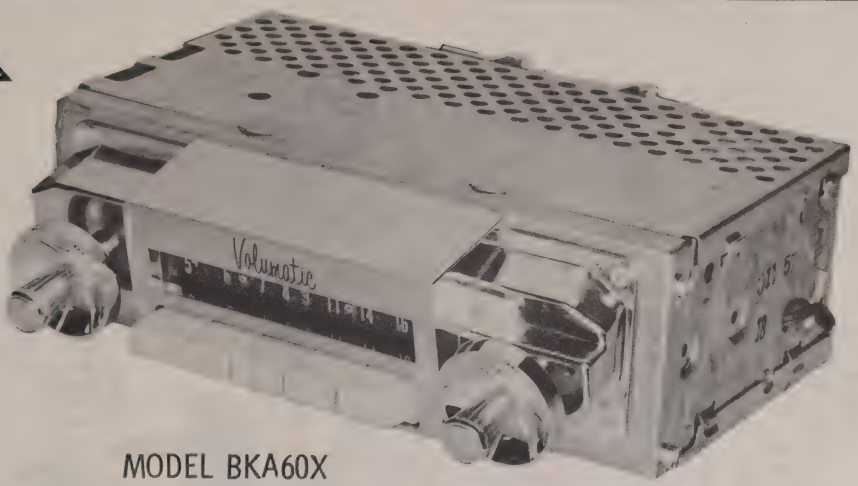


CHASSIS TOP VIEW

PHOTOFACT® Folder

MOTOROLA MODELS BKA60X, CRA60X, PCA60X

MOTOROLA MODELS
BKA60X, CRA60X, PCA60X



MODEL BKA60X

MOTOROLA MODELS
BKA60X, CRA60X, PCA60X

TRADE NAME	Motorola Models BKA60X (For 1960 Buicks), CRA60X (For 1960 Corvairs), PCA60X (For 1960 Pontiacs)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube, 2 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	540 — 1610KC RATING 1.3 Amp. @12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7.... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
A8, A9, A10....GENERAL CEMENT #9050-L, 9150
WALSCO #2521, 2524

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262.5KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, and A10) out of coils. Repeat Step 2.					
3.	Thru dummy to antenna receptacle.	1200KC	Tuner carriage 9/32" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Step 2.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat for remaining pushbuttons.

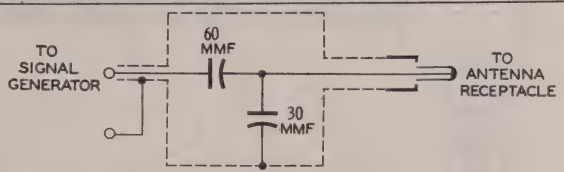


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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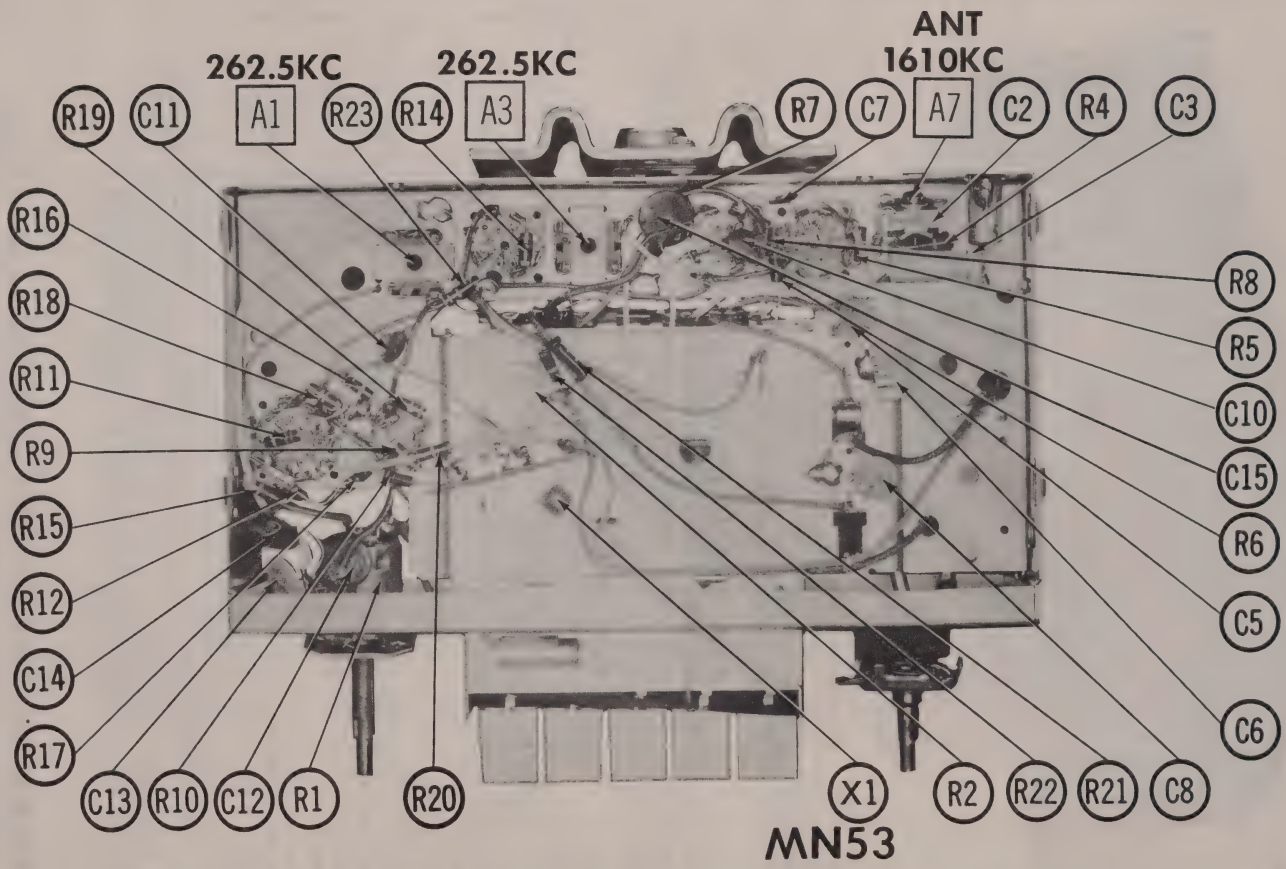
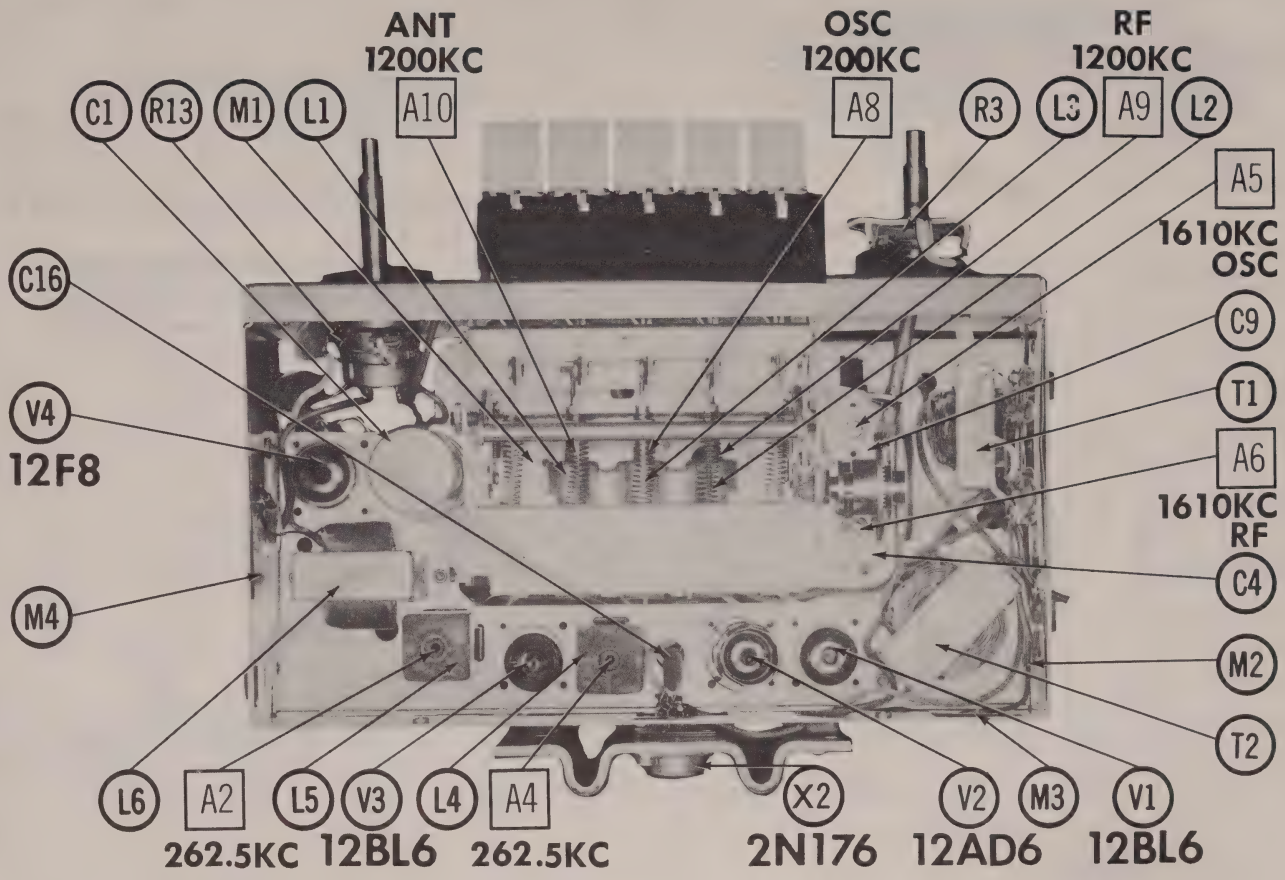
SET 511 FOLDER 9



CHASSIS-BOTTOM VIEW



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	◆ GENERAL ELECTRIC ◆			RAYTHEON ◆ SYLVANIA ◆	
V1	RF Amplifier	12BL6	V3	IF Amplifier*	12BL6
V2	Converter	12AD6	V4	Det.-AVC-AF Amp.	12F8

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	MN-53 *	Driver	2N591	MN-53	2N591	PNP
X2	2N176	Output	2N176		2N176	PNP Note 1

* Alternate Type 2N652

Note 1. When replacing, apply DC-4 grease (Part #1M490487), or equivalent, to both sides of insulator. Tighten mounting screws securely. Check bias adjustment.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	500 ▲	16	23B543279	AFH3-00-95		WP300.85		TVLS-3026.8*	
B	500 ■	16							
C	100	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	40-430	#20A542758						
C3	.002 1000V 10%				DPMS16D2	16DP-2-202 424	GP220	10TS-D20
C4	20-120	#20K541014						
C5	47 N750 10%		N750-47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C6	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C7	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C8	100 N750 10%		N750-DI 100	DTN-100	C10TIU	CCTN-101	CN7-310	10TCU-T10
C9	310-390	#20K541700						
C10	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C11	27 NPO 10%		NPO-DI 25	DTZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C12	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D22
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	25000				DPMS6S25	4DP-2-253	GEM-4125	4TM-S25

\# Motorola Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	18K544234	F1-41	RTV-717C			Tone Note 1
B	2meg			R2-75		† QJ-1294A	■ UE4168-S	Volume
	1meg Tap							
C	Switch			KR-1				Power Off-On
R2	300Ω	2(WW)	18K543493		39-300 *	112-300 *	FL500 *	Bias
	36Ω Stop							
R3	15Ω	2(WW)	18K544296					Fader Note 2

† "CONCENTRIKIT" equivalent: K-15 Kit with base elements & shafts: B13-133, P17-108 (Panel); B18-139X, R1-118 (Rear); 76-1 (Switch)

■ "STA-LOC" equivalent: FB55A, RU26T16, OS1250A, IS1687, US41.

* Use 33Ω series resistor.

Note 1. Model CRA60X uses Part #18K544235
Model PCA60X uses Part #18K544237

Note 2. Model PCA60X uses Part #18B544256. Not used in Model CRA60X.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	22K	
R5	22meg	
R6	3300Ω	
R7	1meg	
R8	47K	
R9	91meg	
R10	4.7meg	

ITEM No.	RATING	REMARKS
R11	3.3meg	
R12	2.7meg	
R13	100K	
R14	330Ω	
R15	3.3meg	
R16	3300Ω	
R17	100Ω	

ITEM No.	RATING	REMARKS
R18	22K	
R19	680Ω	
R20	10K	(6800Ω) *
R21	10Ω Cold	Pt#6K543800
R22	10Ω	
R23	330Ω	

* Used in Model CRA60X.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Ant. Coil	24C535458				
L2	RF Coil	24C535458				
L3	Osc. Coil	24C535456				
L4	Input IF Trans.	24B543286	BC-350	12-H1	RTC-8638	
L5	Output IF Trans.	24K543287	BC-354	12-H6	RTC-8640	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L6	1.3A 1.3A	.3Ω .6Ω	.010 HY .001 HY	25B543338① 25K542487②					① Models BKA60X, PCA60X ② Model CRA60X

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	10	1	25K543448					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.		MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	30Ω Tap @ 3-4Ω		25K543444A ①					①Alternate Part #25K543444

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	50C544380 *	8A21	* Used in Model BKA60X
	5"x 7"	PM	3-4Ω	50C544270 ǂ		ǂ Used in Model PCA60X
	6"x 9"	PM	3-4Ω	50C544396 ♦		♦ Used in Model CRA60X

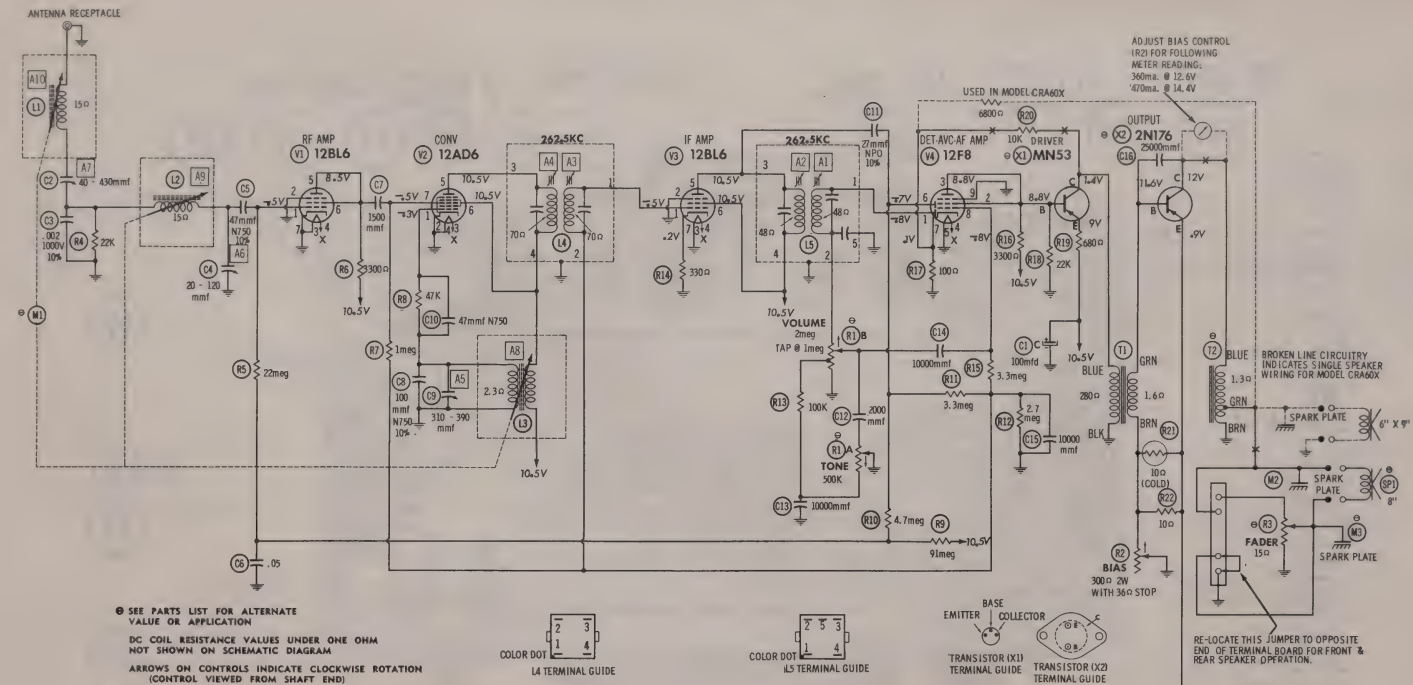
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuner	77K564443	(AT-318) Complete, Model BKA60X
	Tuner	77K562643	(AT-290), Model PCA60X (Less Pushbuttons and Pointer)
	Tuner	77D562548	(AT-281), Model CRA60X (Less Pushbuttons and pointer)
M2	Spark Plate	64K561877	
M3	Spark Plate	64K561877	Not used in Model CRA60X
M4	Spark Plate	64K530177	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Scale	34B544305	Model CRA60X
Dial Scale	34K544272	Model PCA60X
Dial Scale	34B544348	Model BKA60X
Dial Pointer	1V543735	Model PCA60X
Dial Pointer	1V544448	Model BKA60X
Dial Pointer	1V538739	Model CRA60X
Knob	36B542650	Tuning, Volume, Model CRA60X
Knob	36B544225	Tuning, Volume, Model PCA60X
Knob	36B544221	Tuning, Volume, Model BKA60X
Knob	36B544260	Tone, Model PCA60X
Knob	36B543330	Tone, Model CRA60X
Knob	36B544219	Tone & Speaker, Model BKA60X
Knob	36K544262	Speaker, Model PCA60X
Knob	36B543332	Dummy, Model CRA60X



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	33meg	0Ω	0Ω	.1Ω	3600Ω	3600Ω	0Ω		
V2	12AD6	47K	0Ω	.1Ω	0Ω	400Ω	330Ω	3.7meg		
V3	12BL6	2.7meg	0Ω	.1Ω	0Ω	380Ω	330Ω	330Ω		
V4	12F8	1.4meg	2300Ω	2300Ω	.1Ω	0Ω	2.1meg	100Ω	6meg	0Ω

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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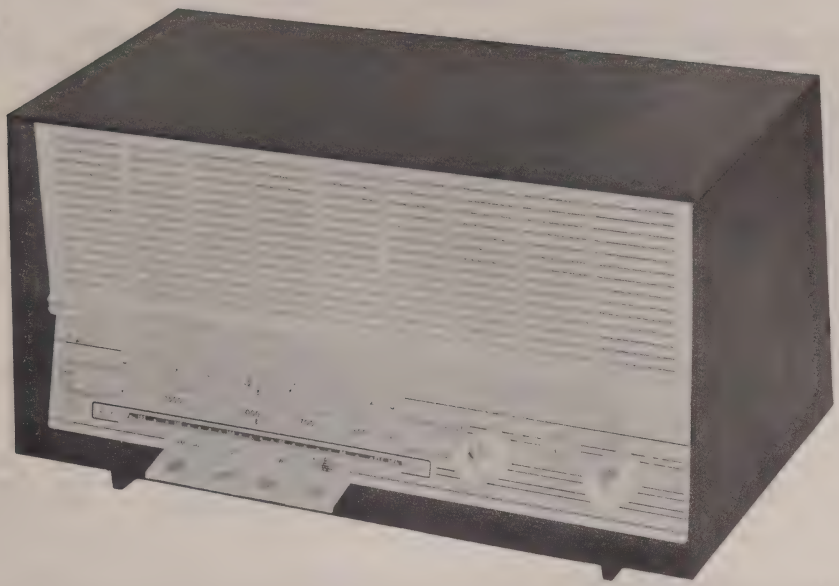
MOTOROLA MODELS
BKA60X, CRA60X, PCA60X

PHOTOFACT® Folder

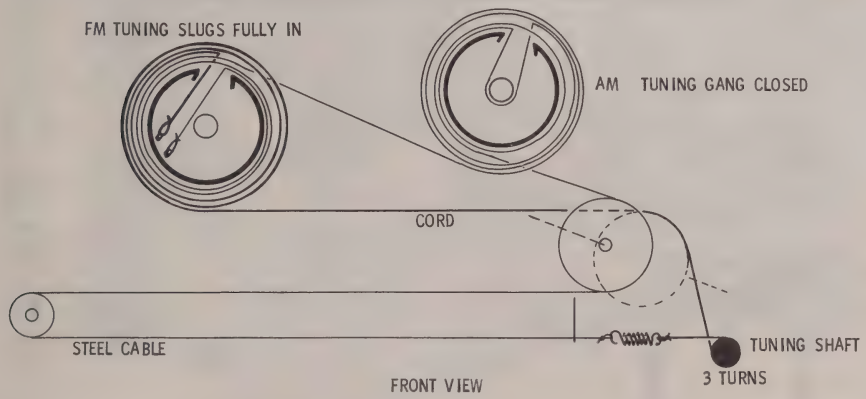
NORELCO
MODEL B2X98A/70R

NORELCO
MODEL B2X98A/70R



TRADE NAME	Norelco Model B2X98A/70R
SUPPLIER	North American Philips Co., Inc., 230 Duffy Ave., Hicksville, N. Y.
TYPE SET	AC Operated 6 Tube FM-BC-SW Receiver
POWER SUPPLY	110/127/220 Volts AC, 60 Cycles RATING 42 Watts, .44 Amp. @117 Volts AC (On 110V Tap)
TUNING RANGES—BROADCAST	517 – 1622KC FREQ. MOD. 88–108MC SHORT WAVE 6– 18.3MC

TUNING DRIVE CORD STRINGING



NORELCO
MODEL B2X98A/70R

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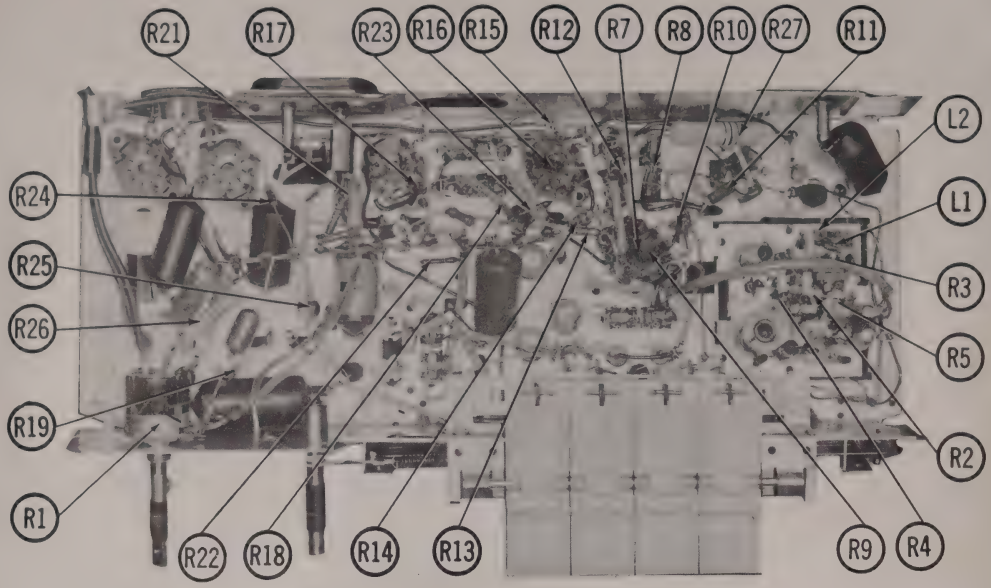
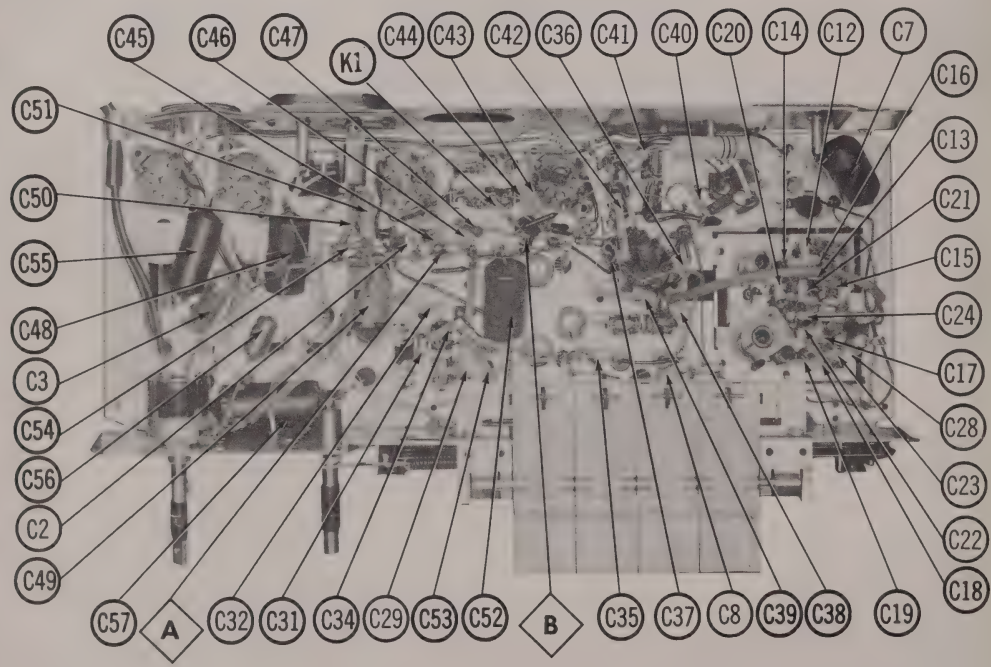
KK180

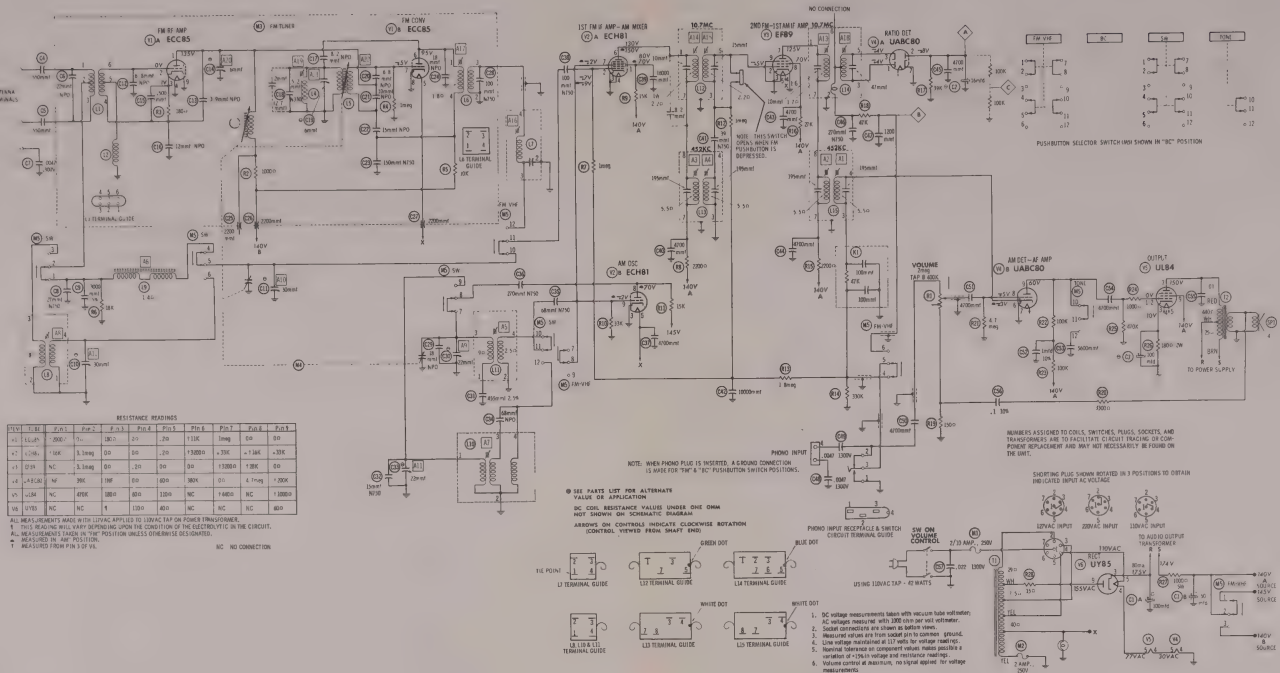
SET 511 FOLDER 10



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


FM RF AMP
V1A ECC85
FM CONV
V1B ECC85
FM TUNER
1ST FM-IF AMP - AM MIXER
V2A ECH81
10.7MC
2ND FM-1ST AM IF AMP 10.7MC
V2B EF89
RATIO DET
V3A UABC80
AM DET - AF AMP
V3B UABC80
AM OSC
V2B ECH81
OUTPUT
V4 UL84
VOLUME
TAP B 400K
ANTENNA TERMINALS
L1 TERMINAL GUIDE
L2 TERMINAL GUIDE
L3 TERMINAL GUIDE
L4 TERMINAL GUIDE
L5 TERMINAL GUIDE
L6 TERMINAL GUIDE
L7 TERMINAL GUIDE
L8 L10 & L11 TERMINAL GUIDE
L9 TERMINAL GUIDE
PUSHBUTTON SELECTOR SWITCH UNIT SHOWN IN "BC" POSITION
NOTE: THIS SWITCH OPENS WHEN FM PUSHBUTTON IS DEPRESSED.
NO CONNECTION
PHONO INPUT
NOTE: WHEN PHONO PLUG IS INSERTED, A GROUND CONNECTION IS MADE FOR "FM" & "BC" PUSHBUTTON SWITCH POSITIONS.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
GREEN DOT
BLUE DOT
WHITE DOT
PHONO INPUT RECEPTACLE & SWITCH CIRCUIT TERMINAL GUIDE
SW ON VOLUME CONTROL
2/3 AMP. 250V
USING 120VAC TAP - 42 WATTS
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SHORTING PLUG SHOWN ROTATED IN 3 POSITIONS TO OBTAIN INDICATED INPUT AC VOLTAGE
105VAC INPUT
117VAC INPUT
125VAC INPUT
TO AUDIO OUTPUT TRANSFORMER
V5 UY85
TO POWER SUPPLY
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of +-15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

TUBE	TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1	ECC85	2000Ω	7Ω	180Ω	20	20	110K	1meg	0Ω	0Ω
V2	ECH81	160K	3.1meg	0Ω	0Ω	20	1300Ω	33K	1.1MEG	33K
V3	EF89	NC	3.1meg	0Ω	20	0Ω	0Ω	1300Ω	18K	0Ω
V4	6.3CA6	NF	39K	1MF	0Ω	600Ω	382K	0Ω	4.1meg	200K
V5	UL84	NC	470K	180Ω	80Ω	110Ω	NC	460Ω	NC	1000Ω
V6	UY85	NC	NC	1Ω	130Ω	40Ω	NC	NC	NC	80Ω

ALL MEASUREMENTS MADE WITH 115VAC APPLIED TO 120VAC TAP ON POWER TRANSFORMER.
* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
∞ MEASURED IN "AM" POSITION
† MEASURED FROM PIN 3 OF V6.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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NORELCO
MODEL B2X98A/70R

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools: A1 thru A4, A9, A11, A20, A21... GENERAL CEMENT #8721, 8722
WALSCO #2519
A5, A7, A8, A13 thru A19.....GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 2 (grid) of AM Converter. Low side to chassis.	452KC (400∿ Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	550KC	(BC) 550KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	6.25MC	(SW) 6.25MC	"	A7, A8	"
4.	"	1500KC	(BC) 1500KC	"	A9, A10	"
5.	"	17MC	(SW) 17MC	"	A11, A12	Adjust for maximum output. Repeat Steps 2 thru 5.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (± 1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 120Ω in each lead.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A13, A14, A15, A16, A17	Adjust for maximum deflection.
7.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	Across FM antenna terminals with 120Ω in each lead.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A13, A14, A15, A16, A17	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
7.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A18	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 120Ω in each lead.	87.5MC (Unmod.)	(FM) 87.5MC	DC probe to point Ⓐ. Common to chassis.	A19, A20	Adjust for maximum deflection.
9.	"	108MC	108MC	"	A21	"
10.	"	100MC	100MC	"	A22	Adjust A22 and retouch A20 for maximum deflection. Repeat Steps 8 thru 10.

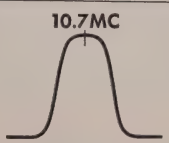


FIG. 1

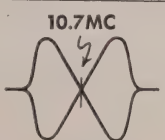
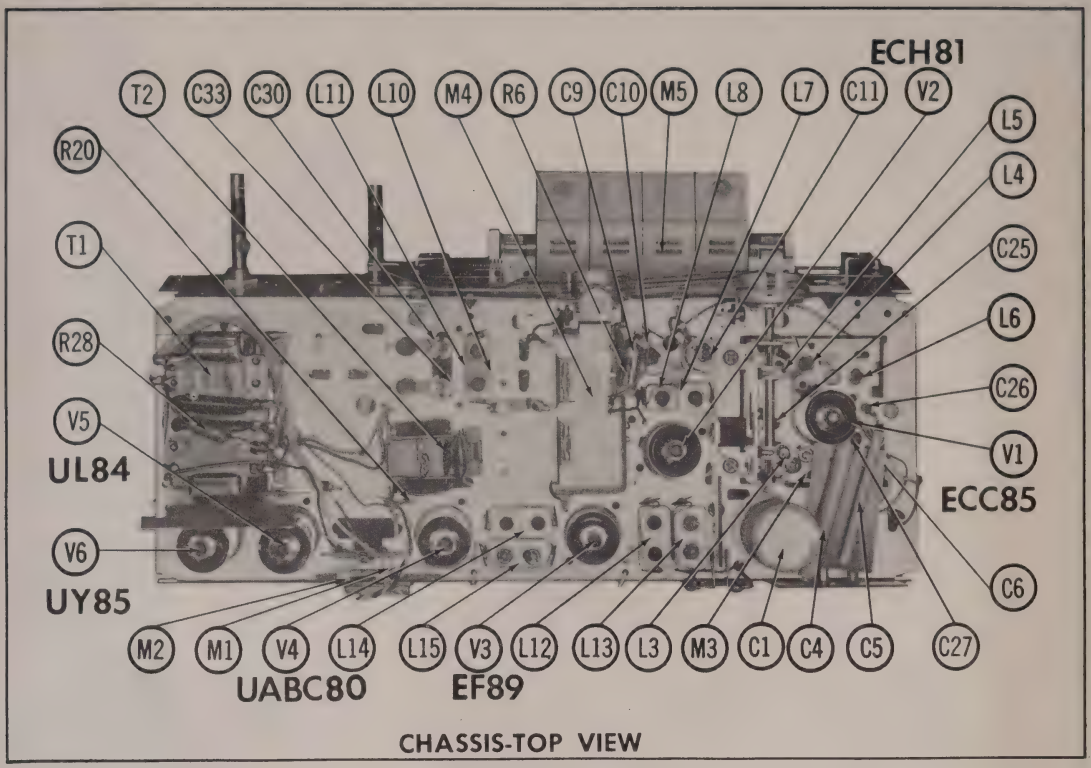
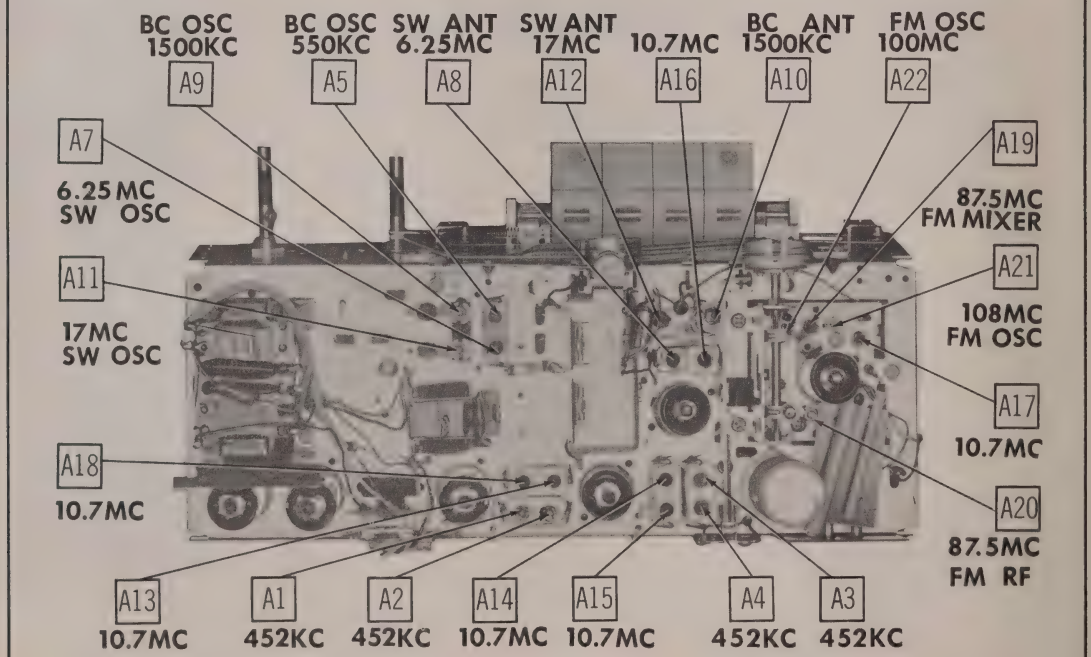


FIG. 2



CHASSIS-TOP VIEW



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85	V4	Ratio Det. -AM Det. - AF Amp.	UABC80
V2	1st FM IF Amp. - AM Mixer-AM Osc.	ECH81	V5	Output	UL84
V3	2nd FM-1st AM IF Amp.	EF89	V6	Rectifier	UY85

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA NORELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■100	250	AC5306/100+50	AFH1-31-25	XA0312	FP129.1	TMS-1550	TVL-1535	
B	▲50	250		PRS1585	BR5025	TC59	TD-50-450	TVA-1512	
C2	16	12.5	AC5713/16	XPP15015	NLW15-25	TT25X15	ML15-25	TE-1156	①
C3	100	12.5	AC5713/100	PRS1200	BBR100-25	TT15X100	ML100-15	TE-1162	②

① Some versions may use 3.2mfd @ 70V in this application (Part #909/E3.2).
② Some versions may use 125mfd @ 12.5V in this application (Part #AC8100/125).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	550		SI 560	D6-561	L10T56	CCD-561	B-356	10TS-T56
C5	550		SI 560	D6-561	L10T56	CCD-561	B-356	10TS-T56
C6	22 NPO		NPO-SI 22	TCZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C7	.0047 1300V		P1684CM-0047	DD30-472	CUBI6D47	16DP-2-472	GEM-16247	MB-D47
C8	27 N750		N750-SI 27	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C9	3000 5%				1DR5D3	CM-20B-302J	MCE461	MS-23
C10	30	Note 1						
C11	30	Note 1						
C12	6.8 NPO		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C13	3.9 NPO				C10V4C			10TCC-V39
C14	6	Note 1						
C15	1500		SI 1500	D6-152	BYA10D15	CCD-152	B-215	5HK-D15
C16	12 NPO		NPO-SI 12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C17	8.2 NPO		NPO-SI 8.2		C10V82C			10TCC-V82
C18	5.2 N330	(2.7) †				*		
C19	6	Note 1						
C20	6.8 NPO		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTN-6R8		10TCC-V68
C21	10 NPO		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C22	15 NPO		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C23	150 N750		N750-SI 150	TCN-150	C10T15U	CCTN-151	CN7-315	10TCU-T15
C24	18 NPO		NPO-SI 18	TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C25	2200							
C26	2200							
C27	2200							
C28	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C29	18 NPO		NPO-SI 18	TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C30	22	Note 1						
C31	455 2.5%							
C32	15 N750		N750-SI 15	TCN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C33	22	Note 1						
C34	68 NPO		NPO-SI 68	TCZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C35	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C36	270 N750		N750-SI 270	TCN-270	C10T27U	CCTN-271	CN7-327	10TCU-T27
C37	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C38	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C39	10000		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C40	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C41	39 N750		N750-SI 39	TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C42	10000		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-S10
C43	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C44	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C45	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C46	270 N750		N750-SI 270	TCN-270	C10T27U	CCTN-270	CN7-327	10TCU-T27
C47	1200		SI 1200	D6-122	L10D12	CCD-122	B-212	10TS-D12
C48	.0047 1300V		P1684CM-0047	DD30-472	CUBI6D47	16DP-2-472	GEM-16247	MB-D47
C49	.0047 1300V		P1684CM-0047	DD30-472	CUBI6D47	16DP-2-472	GEM-16247	MB-D47
C50	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C51	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
V52	1mfd 125V 10%		V84C2W1-10%		PM2W1		GEM-21	2TM-M1
C53	5600		SI 5600	D6-562	DPMS6D56	CCD-562	B-256	10TS-D56
C54	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C55	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C56	.1 125V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P10
C57	.022 1300V		P1684CM-022		CUBI6S22	16DP-5-223	GEM-1612	MB-S22

† Alternate Value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Nominal value listed.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA NORELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg 400K Tap	½	E098AK/00B 20					Volume
B	Switch							Push-Pull Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1000Ω	
R3	180Ω	
R4	1meg	
R5	10K	
R6	18K	
R7	1meg	
R8	2200Ω	
R9	15K 1W	
R10	33K	

ITEM No.	RATING	REMARKS
R11	15K	
R12	1meg	
R13	1.8meg	
R14	330K	
R15	2200Ω	
R16	27K	
R17	39K	
R18	47K	
R19	150Ω	

ITEM No.	RATING	REMARKS
R20	3300Ω	
R21	4.7meg	
R22	100K	
R23	100K	
R24	1000Ω	
R25	470K	
R26	180Ω 2W	
R27	1000Ω 5W	IRC#PW5-1KΩ
R28	15Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA NORELCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	NOTES
L1	FM Ant. Trans.	A398518				
L2	FM Ant. Coil	A380323				
L3	FM RF Coil	A398520				
L4	FM Mixer Coil	A398508				
L5	FM Osc. Coil	A398519				
L6	1st FM IF Trans.	A398507				
L7	1st FM IF Grid Coil	A312783				
L8	SW Ant. Trans.	A312710				
L9	Loopstick	A380331	BC-419			
L10	SW Osc. Coil	923/16-50M				
L11	BC Osc. Coil	923U/185-590M				
L12	2nd FM IF Trans.	926/10,7-2				
L13	1st AM IF Trans.	925/452-2				
L14	Ratio Detector	926/10,7RD-2				
L15	2nd AM IF Trans.	925/452-2				

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	REPLACEMENT DATA NORELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	220V Tap ⓐ 155V ⓐ .080A, Tap ⓐ 127V, Tap ⓐ 117V ⓐ .44A (110V Tap) Tap ⓐ 6.3V ⓐ 1.1A	A316209					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA NORELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	3700Ω Tap ⓐ 5%	3-4Ω	A315410					

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA NORELCO PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	AD1400W	4A1	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	NORELCO PART No.	REPLACEMENT DATA
K1	AM Diode RF Filter	100mmf, 100mmf, 47K		Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA NORELCO PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M1		2/10A 250V						
M2		2A 250V						

MISCELLANEOUS

ITEM No.	PART NAME	NORELCO PART No.	NOTES
M3	Tuner Assy.	4900194	FM
M4	Tuning Cap.		AM, Ant. 11-485mmf, Osc. 10-176mmf
M5	Switch Assy.		Function Selector (Pushbutton Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial	928/B2X98A	Scale
Knob	A378296	Tuning, Volume
Knob	A323075	Voltage Adapter
Cabinet	P406067/801/BJ	
Front	P521018/159/FA	Cabinet
Pushbutton	P542030/139/KW	FM, MW, SW, Tone

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

**OLYMPIC
MODEL RP-10**

OLYMPIC
MODEL RP-10

OLYMPIC
MODEL RP-10

TRADE NAME	Olympic Model RP-10
MANUFACTURER	Olympic, A Div. of the Siegler Corp., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 6 Tube AM Receiver With 4 Speed Automatic Record Changer (Stereo)
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 32 Watts, .35 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	540 - 1650KC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11
OR RECORD CHANGER MANUAL RC-11

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice Coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1650KC	"	"	A5	"
3.	Loop	1500KC	1500KC Signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output. Repeat Steps 2 and 3.

SET 511 FOLDER 11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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KP208

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Channel 1 Output	35C5
V2	IF Amplifier	12BA6	V5	Channel 2 AF Amp.	12AV6
V3	Det.-AVC-Channel 1 AF Amp	12AV6	V6	Channel 2 Output	35C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	COH30224	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							
C2	10	150	COH30225	PRS1410	BBR10-150	TC42	TD-10-150	TVA-1406	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C4	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C5	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C6	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C7	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C8	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C9	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C13	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C14	.02 400V		P488N-02	DD-502	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg		PTH30220 *					Volume, Channel 2
B	2meg							Volume, Channel 1
R2A	500K		PTH30221	B-60	AD47-500K-Z		FA55A	Tone, Channel 1
B	500K			SR-60	Not Req.		RU55A	Tone, Channel 2
C	Shaft			Not Req.	KSS-3		CS3500	
D	Switch			KR-1	SWE-12		US4I	Power Off-On

* Clutch type control. To adjust individual control, hold one shaft and turn the other.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

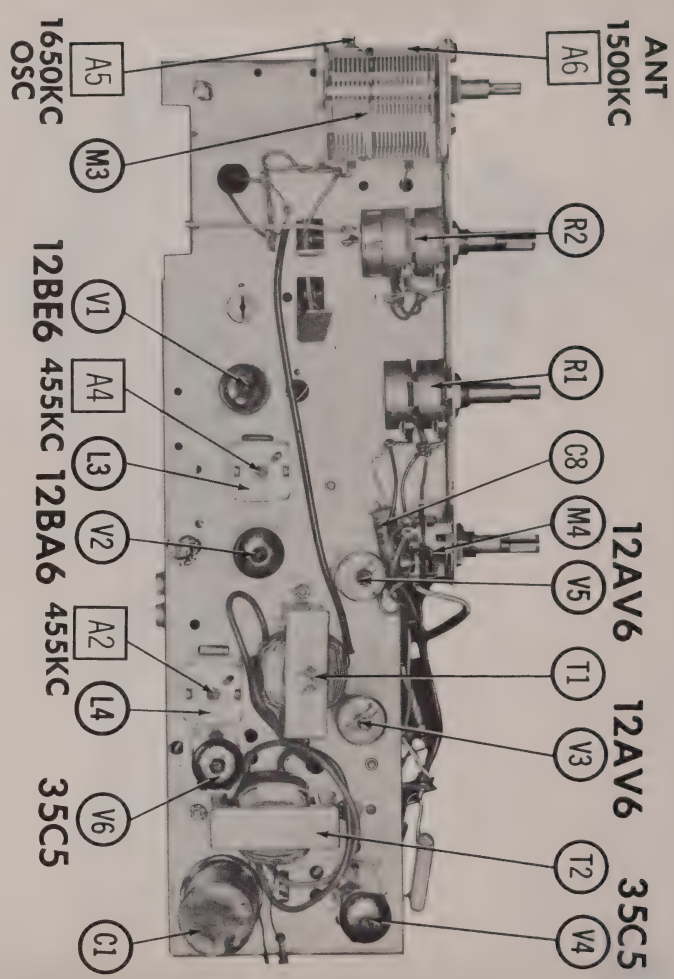
ITEM No.	RATING	REMARKS
R3	2.2meg	
R4	1000Ω	
R5	22K	
R6	2.2meg	
R7	150Ω	
R8	470K	

ITEM No.	RATING	REMARKS
R9	6.8meg	
R10	200K	(220K) *
R11	200K	(220K) *
R12	470K	
R13	150Ω	
R14	6.8meg	

ITEM No.	RATING	REMARKS
R15	470K	
R16	150Ω	
R17	22K	
R18	1000Ω 1W	
R19	47Ω 1W	
R20	33Ω	IRC#FR-33Ω

* Alternate Value.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Loopstick	LPH30235	BC-419	705-A		
L2	Osc. Coil	CLH30236	BC-393	69-OSC	RTC-8646	
L3	Input IF Trans.	TRH30237	BC-352	12-C1	RTC-8632	
L4	Output IF Trans.	TRH30237	BC-353	12-C2	RTC-8633	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	OLYMPIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	3-4Ω	TRH30223	A-3018①	A-3849①	22S45	S-1X	① Drill New Mounting Hole.
T2	2900Ω	3-4Ω	TRH30223	A-3018①	A-3849①	22S45	S-1X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	SKH30228	6A15	
SP2	5"	PM	3-4Ω	SKH30229	5A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	OLYMPIC PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.095A	RFH30290		1N1763	40H	SR-200	Silicon Type

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	OLYMPIC PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			76-TS-TB	N8-1 * and 88-3 *	26S	S1-1 * and S3-3 *	8TA4-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M3	Tuning Cap	CVH30226	2 Gang (Ant. 356mmf Max., Osc. 15-115mmf)
M4	Switch	SWH30222	Radio-Phono (3 Position-DP Slide Type)

CABINETS & CABINET PARTS

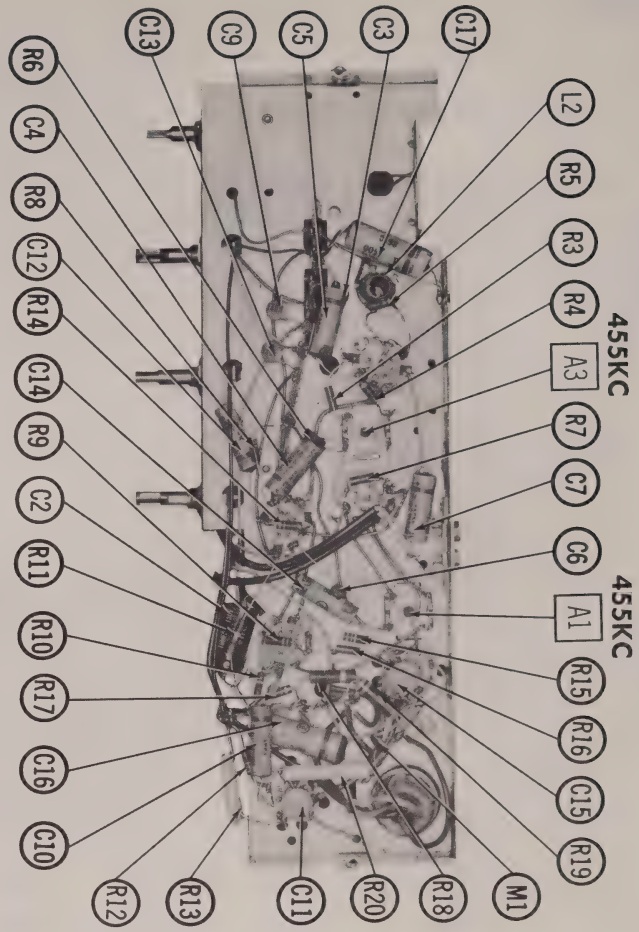
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

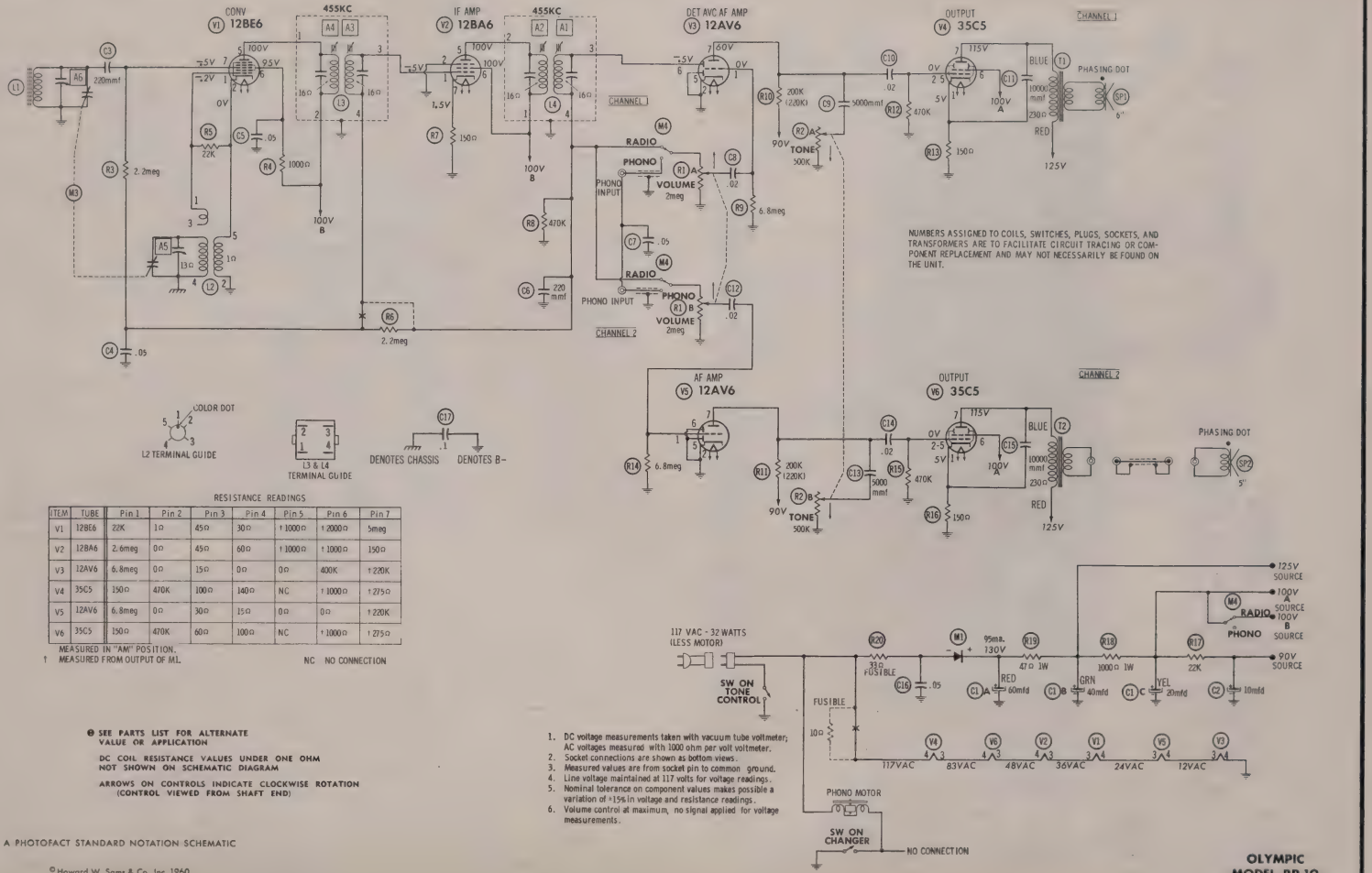
NAME	PART NO.	DESCRIPTION
Knob	KNH30292	Tuning
Knob	KNH30293	Volume, Channel B
Knob	KNH30296	Volume, Channel A
Knob	KNH30295	Tone
Knob	KNH30294	Selector
Cabinet	CAH30298	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1Ω	45Ω	30Ω	†1000Ω	†2000Ω	5meg
V2	12BA6	2.6meg	0Ω	45Ω	60Ω	†1000Ω	†1000Ω	150Ω
V3	12AV6	6.8meg	0Ω	15Ω	0Ω	0Ω	400K	†220K
V4	35C5	150Ω	470K	100Ω	140Ω	NC	†1000Ω	†275Ω
V5	12AV6	6.8meg	0Ω	30Ω	15Ω	0Ω	0Ω	†220K
V6	35C5	150Ω	470K	60Ω	100Ω	NC	†1000Ω	†275Ω

MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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OLYMPIC MODEL RP-10

PHOTOFACT® Folder with CIRCUITRACE®

PHILCO MODEL H-1716M

PHILCO
MODEL H-1716M

PHILCO
MODEL H-1716M

TRADE NAME	Philco Model H-1716M
MANUFACTURER	Philco Corp., Tioga & C Streets, Philadelphia, Pa.
TYPE SET	AC Operated 8 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-120 Volts AC, 60 Cycles RATING 105 Watts, 1 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER M-45 — SEE SIMILAR GLASER-STEERS GS-77 (REVISED) — PHOTOFACT SET 482 FOLDER 11

SET 511 FOLDER 12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT082

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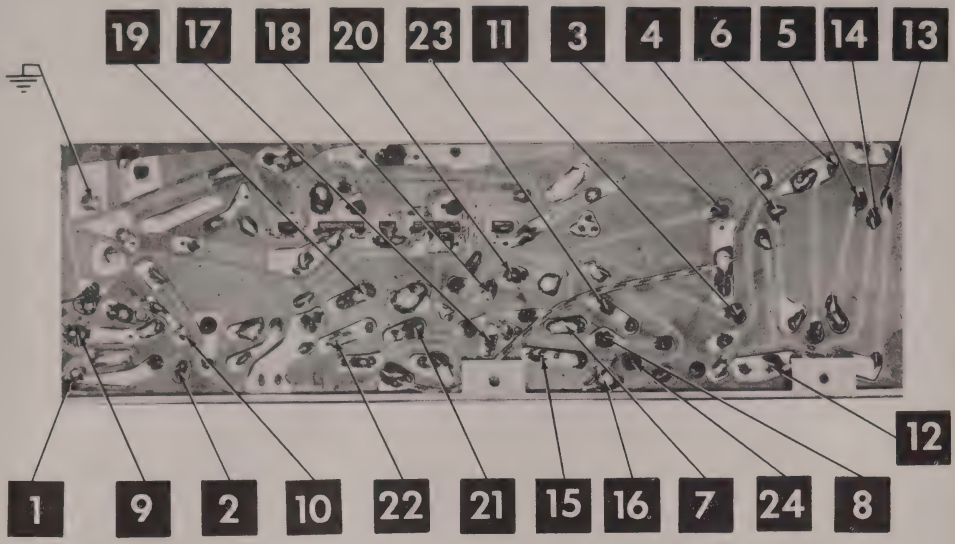

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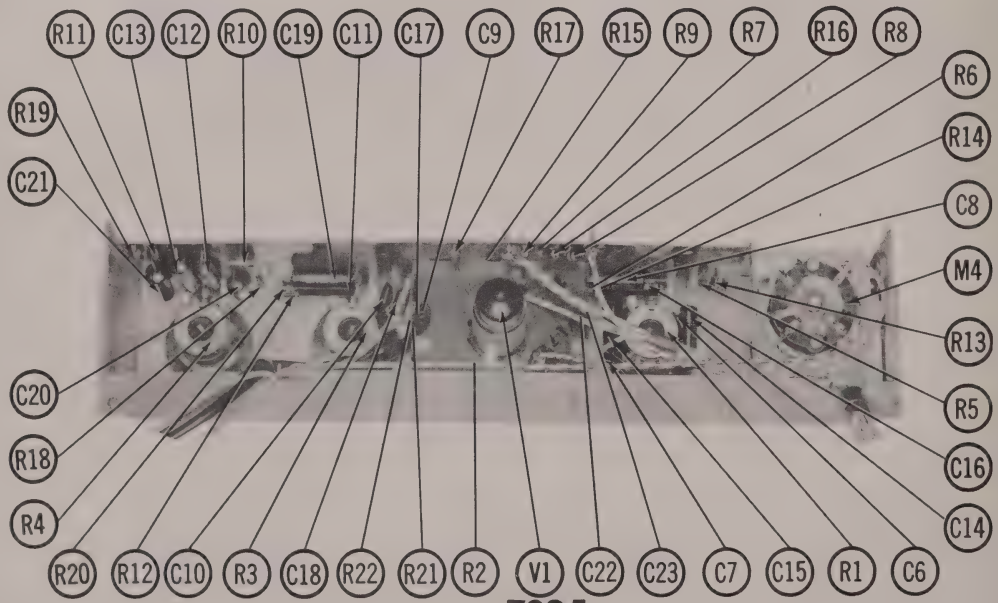
PRINTED BOARD



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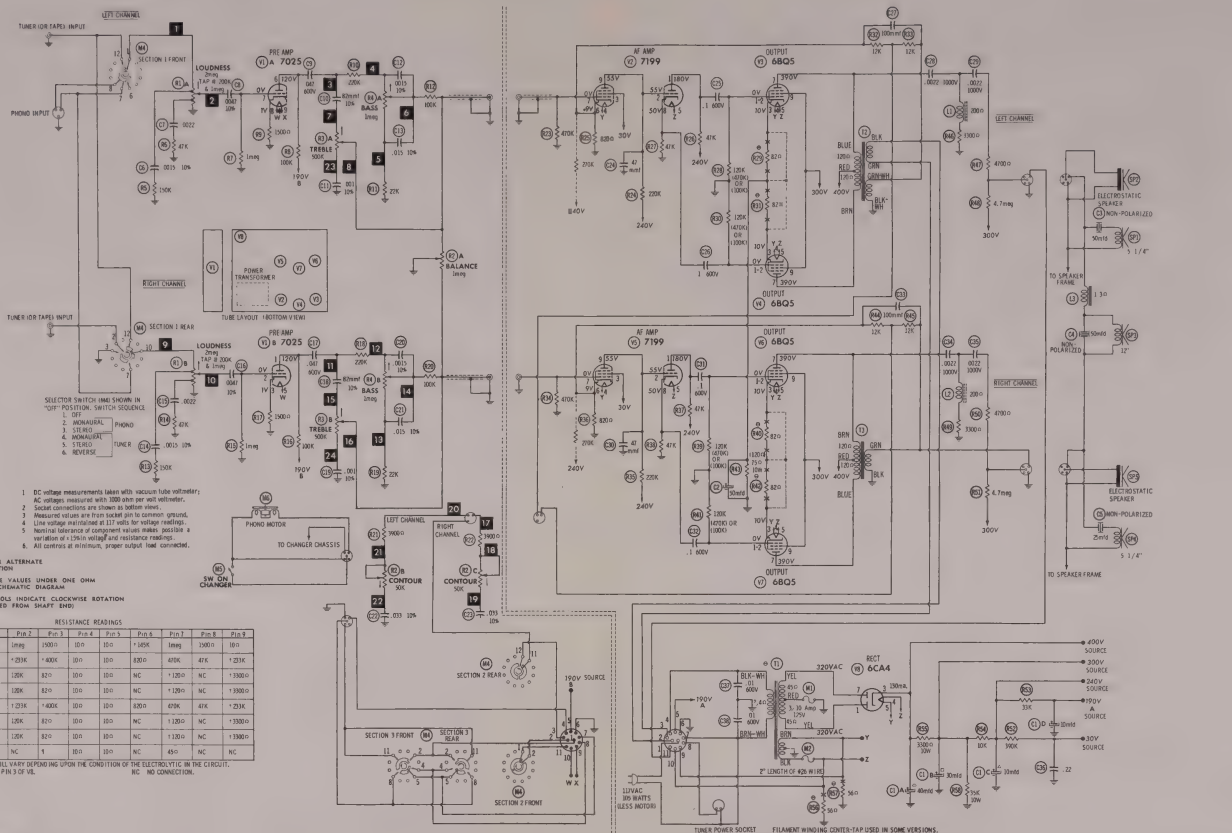
PREAMP CHASSIS



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	* 145K	1meg	1500Ω	10Ω	10Ω	* 145K	1meg	1500Ω	10Ω
V2	7199	* 60K	* 293K	* 400K	10Ω	10Ω	830Ω	470K	47K	* 233K
V3	6BQ5	NC	125K	82Ω	10Ω	10Ω	NC	* 125Ω	NC	* 330Ω
V4	6BQ5	NC	125K	82Ω	10Ω	10Ω	NC	* 129Ω	NC	* 330Ω
V5	7199	* 60K	* 293K	* 400K	10Ω	10Ω	820Ω	470K	47K	* 233K
V6	6BQ5	NC	125K	82Ω	10Ω	10Ω	NC	* 125Ω	NC	* 330Ω
V7	6BQ5	NC	125K	82Ω	10Ω	10Ω	NC	* 125Ω	NC	* 330Ω
V8	6CA4	45Ω	NC	1	10Ω	10Ω	NC	45Ω	NC	NC

* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V8. NC NO CONNECTION.

FILAMENT WINDING CENTER-TAP USED IN SOME VERSIONS. (TRANSFORMER PART #32-8932-4) IN THESE VERSIONS, R96 & R97 NOT USED.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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PHILCO MODEL H-1716M

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC • RAYTHEON • SYLVANIA)
V1	Left Channel Preamp. - Right Channel Preamp.	7025
V2	Left Channel AF Amp. - Phase Inv.	7199
V3	Left Channel Output	6BQ5
V4	Left Channel Output	6BQ5
V5	Right Channel AF Amp. - Phase Inv.	7199
V6	Right Channel Output	6BQ5
V7	Right Channel Output	6BQ5
V8	Rectifier	6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	30-2590-39	AFH4-18-10	DO171	FP446	TMT-3739	TVL-4771.8	
B	■30	450					TD-10-450		
C	▲10	450							
D	10	450							
C2	50	50	30-2596-2	PRS1350	BR505	TC39	TD-50-50	TVA-1308	
C3	50	25NP	30-2593-5	PRS7330	BR5015	TC2501 †		TVANS-1206.1*	
C4	50	25NP	30-2593-5	PRS7330	BR5015	TC2501 †		TVANS-1206.1*	
C5	25	25NP	30-2593-2	PRS7350	BR2515	TCN3520		TVANS-1205.1*	

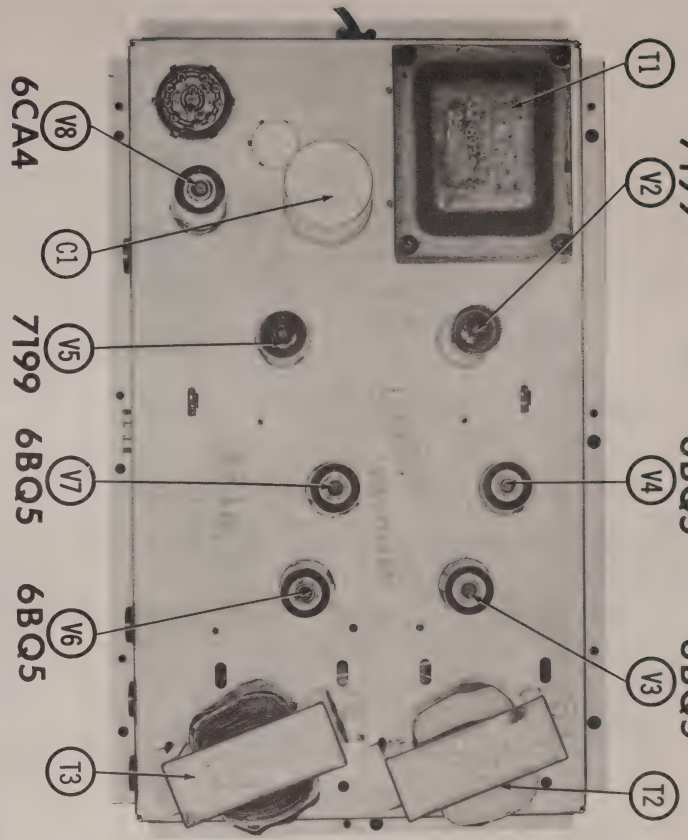
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.0015 400V 10%		V84C4D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C7	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C8	.0047 400V 10%		V84C4D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C9	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C10	82 10%		1469-000082	TCZ-82	22R5Q82	CM-19B-820K	CNO-482	MS-482
C11	.001 400V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D10
C12	.0015 400V 10%		V84C4D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C13	.015 400V 10%		V84C4S15-10%		PM4S15	4DP-1-153		4TM-S15
C14	.0015 400V 10%		V84C4D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C15	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C16	.0047 400V 10%		V84C4D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C17	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C18	82 10%		1469-000082	TCZ-82	22R5Q82	CM-19B-820K	CNO-482	MS-482
C19	.001 400V 10%		V84C6D1-10%	DD-102	PM6D1	6DP-1-102	GEM-1621	6TM-D10
C20	.0015 400V 10%		V84C4D15-10%	DD-152	PM6D15	6DP-1-152	GEM-16215	6TM-D15
C21	.015 400V 10%		V84C4S15-10%		PM4S15	4DP-1-153		6TM-S15
C22	.033 400V 10%		V84C4S33-10%		PM4S33	4DP-2-333	GEM-1613	6TM-S33
C23	.033 400V 10%		V84C4S33-10%		PM4S33	4DP-2-333	GEM-1613	6TM-S33
C24	47		1468-000047	TCZ-47	5W5Q47	CM-19B-470M	CNO-447	1FM-447
C25	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C26	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C27	100		1468-0001	TCZ-100	5W5T1	CM-19B-101M	MC235	1FM-31
C28	.0022 1000V		P1088N-0022	DD-222	CUB10D22	16DP-2-222	GEM-10222	10TM-D22
C29	.0022 1000V		P1088N-0022	DD-222	CUB10D22	16DP-2-222	GEM-10222	10TM-D22
C30	47		1468-000047	TCZ-47	5W5Q47	CM-19B-470M	CNO-447	1FM-447
C31	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C32	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C33	100		1468-0001	TCZ-100	5W5T1	CM-19B-101M	MC235	1FM-31
C34	.0022 1000V		P1088N-0022	DD-222	CUB10D22	16DP-2-222	GEM-10222	10TM-D22
C35	.0022 1000V		P1088N-0022	DD-222	CUB10D22	16DP-2-222	GEM-10222	10TM-D22
C36	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C37	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C38	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *		33-5599-3					Loudness, Left Channel
B	2meg *							Loudness, Right Channel
R2A	1meg		33-5599-4					Balance
B	50K							Contour, Right Channel
C	50K							Contour, Left Channel
R3A	500K		33-5599-1					Treble, Right Channel
B	500K							Treble, Left Channel
R4A	1meg		33-5599-2					Bass, Right Channel
B	1meg							Bass, Left Channel

* Taps @ 200K & 1meg.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	150K	
R6	47K	
R7	1meg	
R8	100K	
R9	1500Ω	
R10	220K	
R11	22K	
R12	100K	
R13	150K	
R14	47K	
R15	1meg	
R16	100K	
R17	1500Ω	
R18	220K	
R19	22K	
R20	100K	
R21	3900Ω	
R22	3900Ω	

ITEM No.	RATING	REMARKS
R23	470K	
R24	220K	
R25	820K	
R26	47K	
R27	47K	
R28	120K	(470K) *
R29	82Ω	Note 1
R30	170K	(470K) *
R31	82Ω	Note 1
R32	12K	
R33	12K	
R34	470K	
R35	220K	
R36	820Ω	
R37	47K	
R38	47K	
R39	120K	(470K) *
R40	82Ω	Note 1

ITEM No.	RATING	REMARKS
R41	120K	(470K) *
R42	82Ω	Note 1
R43	75Ω 10W	(120Ω) * IRC#PW10-75Ω
R44	12K	
R45	12K	
R46	3300Ω	
R47	4700Ω	
R48	4.7meg	
R49	3300Ω	
R50	4700Ω	
R51	4.7meg	
R52	390K	
R53	33K	
R54	10K	
R55	3300Ω 10W	IRC#PW10-3300Ω
R56	56Ω	Note 2
R57	56Ω	Note 2
R58	35K 10W	IRC#PW10-35K

Note 1. Not used in some versions.
Note 2. Not used with filament center tap transformer Part #32-8932-4.
* Alternate Value.

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	Crossover Choke	32-4628				100MH
L2	Crossover Choke	32-4628				100MH

CROSSOVER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L3		1.3Ω	.010 HY	32-8923-1					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ 1A	640VCT @ .130A	6.3V @ 5.1A	32-8932-3 ①					①Some versions use Part #32-8932-4 (Center tap filament winding)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5700Ω CT	11.5Ω	32-8930-2					
		SEC. 2						
		6-8Ω						
		SEC. 1						
T3	5100Ω CT	6-8Ω	32-8930-1	A-2905	A-3880	24S42		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	5 1/4"	PM	8-10Ω	36-1669-17	52A2IZ10	
SP2	Electrostatic			36-1656-1		
SP3	12"	PM	14-16Ω	36-1678-4	12A6AZ16	
SP4	5 1/4"	PM	8-10Ω	36-1669-17	52A2IZ10	
SP5	Electrostatic			36-1656-1		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/10A 125V S/B P/T	45-2656-64		315.300 (3AG 3/10A S/B P/T)		MDV 3/10	
M2	2½" length of #26 wire.		L3477					

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	PHILCO PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M3			13TB	Not Req.	26S	S1-1 * and S3-3 *	8TA4-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Switch	42-2112-1	Function
M5	Switch		Changer-Off-On (Part of Changer)
M6	Motor		Turntable Drive (Part of Changer)
	Printed Board	54-5565	Control Unit

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

AMP CHASSIS — BOTTOM VIEW

MODEL H-1716M

PHILCO

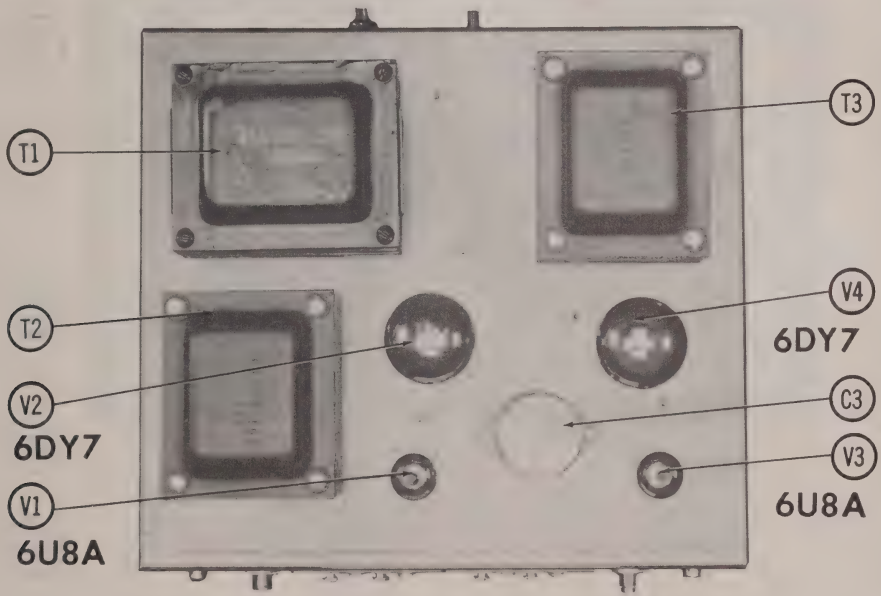
PHOTOFACT® Folder

STROMBERG-CARLSON MODEL ASP-422

STROMBERG-CARLSON
MODEL ASP-422

TRADE NAME	Stromberg - Carlson Model ASP-422
MANUFACTURER	Stromberg - Carlson Co., A Div. of General Dynamics Corp., Commercial Products Div., 1400 N. Goodman Street, Rochester 9, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Amplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 75 Watts, .73 Amp. @ 117 Volts AC

STROMBERG-CARLSON
MODEL ASP-422



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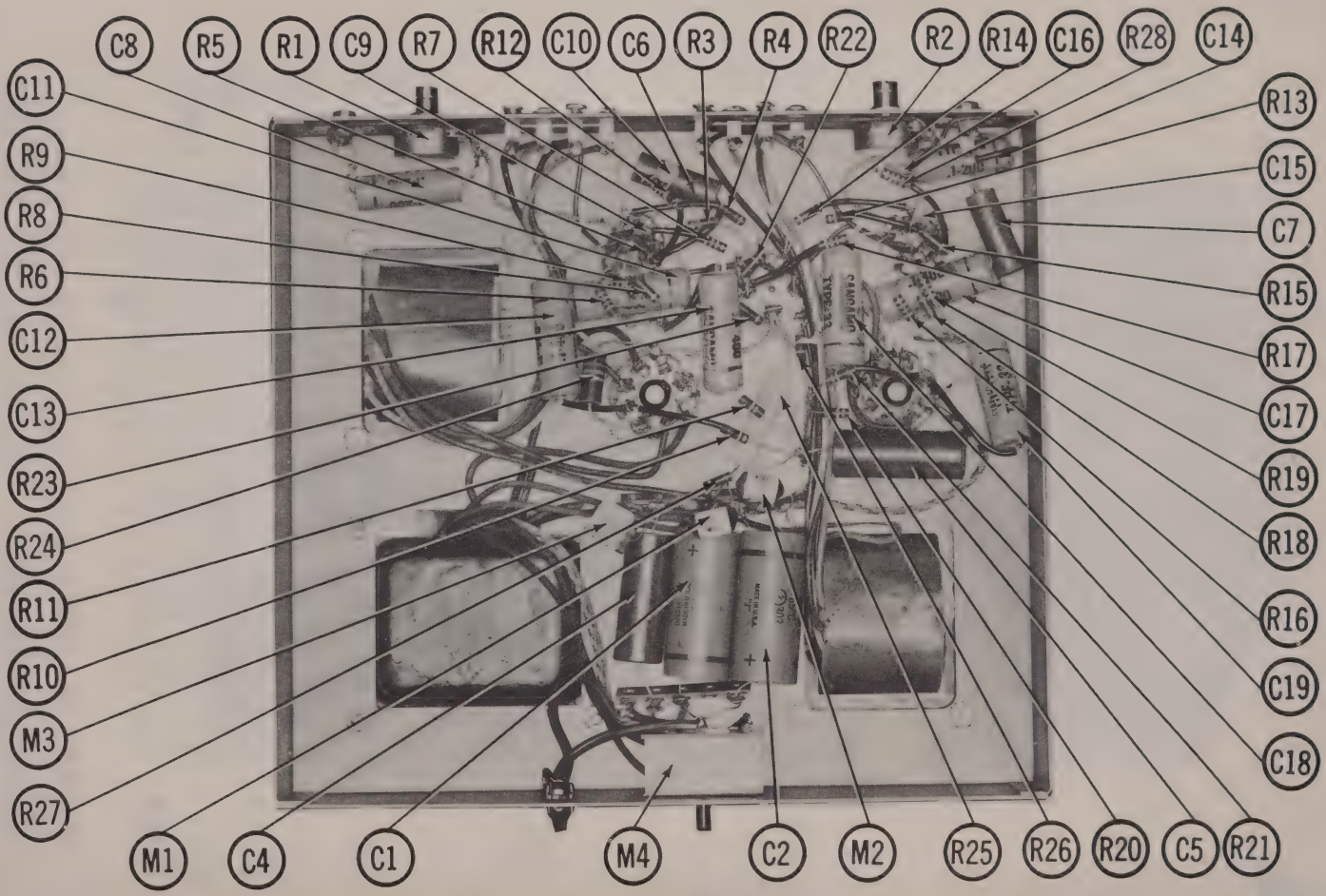
SET 511 FOLDER 13



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC / RAYTHEON / SYLVANIA USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A AF Amp. - Phase Inv.	6U8A	V3	Channel B AF Amp. - Phase Inv.	6U8A
V2	Channel A Output	6DY7	V4	Channel B Output	6DY7

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	50	200		PRS1585	BR5025	TC59	TD-50-450	TVA-1512	
C2	50	200		PRS1585	BR5025	TC59	TD-50-450	TVA-1512	
C3A	▲20	450		AFH4-19-10	DO179.3	FP474.5	TMQ-4616	TVL-4832	
B	■20	450							
C	▲10	400							
D	10	400							
C4	50	50		PRS1350	BR505	TC39	TD-50-50	TVA-1308	
C5	50	50		PRS1350	BR505	TC39	TD-50-50	TVA-1308	
C6	4	150		PRS1400	BBR4-150	TT150X4	TD-4-150	TVA-1402	
C7	4	150		PRS1400	BBR4-150	TT150X4	TD-4-150	TVA-1402	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C9	47 N1500			TCL-47				
C10	82 N1500							
C11	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C12	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C13	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C14	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C15	47 N1500			TCL-47				
C16	82 N1500							
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C18	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C19	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	145000-085	AB-50	A47-250K-S	Q11-130	U46	Gain, Channel A
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	
R2A	250K	½	145000-085	AB-50	A47-250K-S	Q11-130	U46	Gain, Channel B
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	220K	
R4	1meg	
R5	2200Ω	
R6	470K	
R7	47K	
R8	2200Ω	
R9	47K	
R10	100K	
R11	100K	

ITEM No.	RATING	REMARKS
R12	33K	
R13	220K	
R14	1meg	
R15	2200Ω	
R16	470K	
R17	47K	
R18	2200Ω	
R19	47K	
R20	100K	

ITEM No.	RATING	REMARKS
R21	100K	
R22	10K	
R23	1000Ω	
R24	56K 2W	
R25	7500Ω 7W	IRC#PW10-7500Ω
R26	2700Ω	
R27	1000Ω	
R28	33K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Stromberg-Carlson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ .73A	150V @ .420A	6.3V @ 1.6A	161000-224					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 1.6A	38V @ .010A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Stromberg-Carlson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7000Ω CT	16Ω Tap @ 8Ω, 4Ω	161000-169					
T3	7000Ω CT	16Ω Tap @ 8Ω, 4Ω	161000-169					

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Stromberg-Carlson PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.100A	162000-011 *		1N1764 *	60K *	SR500 *	* Silicon Type
M2	.100A	162000-011 *		1N1764 *	60K *	SR500 *	‡ Selenium Type
M3	.010A	162000-007 ‡			10 ‡		

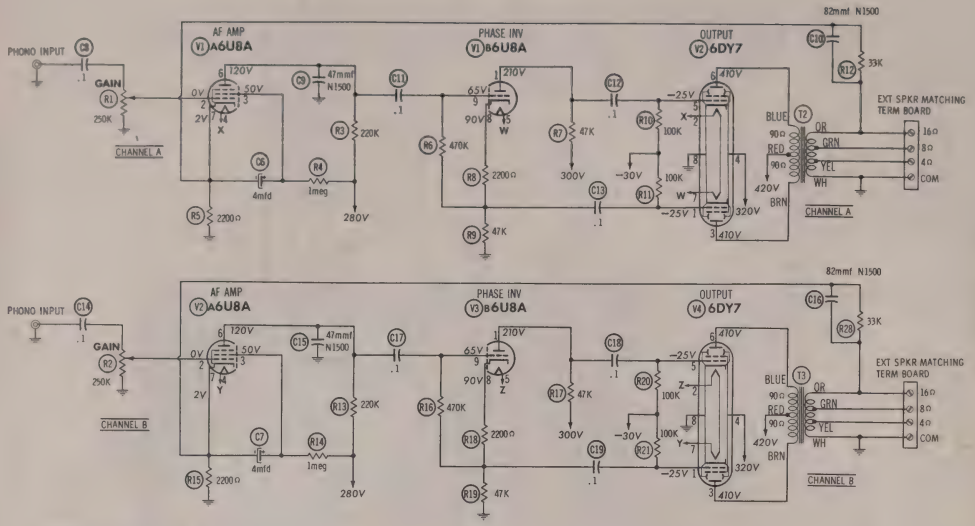
MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M4	Circuit Breaker	158000-134	(1.8 Amp.)

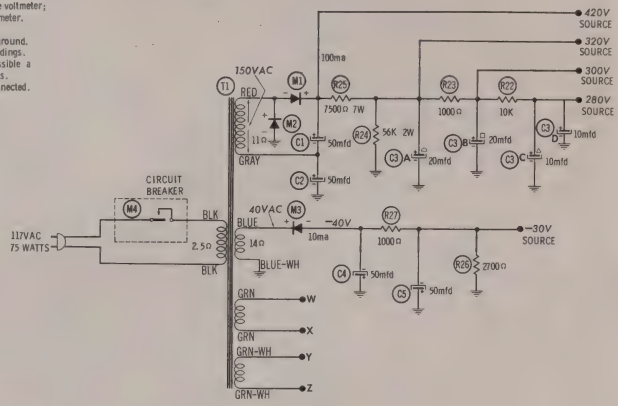
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6U8A	†55K	0Ω	†1meg	INF	INF	†235K	2200Ω	50K	520K
V2	6DY7	100K	INF	†90Ω	†7500Ω	100K	†90Ω	INF	0Ω	
V3	6U8A	†55K	0Ω	†1meg	INF	INF	†235K	2200Ω	50K	520K
V4	6DY7	100K	INF	†90Ω	†7500Ω	100K	†90Ω	INF	0Ω	

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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STROMBERG-CARLSON
MODEL ASP-422

PHOTOFACT® Folder

SYMPHONIC
MODELS 22-S, 24-S, 1522

SYMPHONIC
MODELS 22-S, 24-S, 1522

MODEL 1522

SYMPHONIC
MODELS 22-S, 24-S, 1522

TRADE NAME	Symphonic Models 22-S, 22-S (Revised), 24-S, 1522
MANUFACTURER	Symphonic Radio & Electronics, 235 Jersey Ave., New Brunswick, N. J.
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 28 Watts, .28 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT154

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SET 511 FOLDER 14

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	AF Amp. -Phase Inv.	12AX7
V2	Output	50C5

ITEM No.	USE	TYPE
V3	Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYMPHONIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	CE101	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C3	220	Note 1	BPD-00022	DD-221	L10T22	CCD-221	GP322	5GA-T22
C4	680		BPD-00068	DD-681	L10T68	CCD-681	GP368	5GA-T68
C5	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C6	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	5GA-T10
C7	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C8	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C12	.5 50V	Note 2	P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50
C13	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

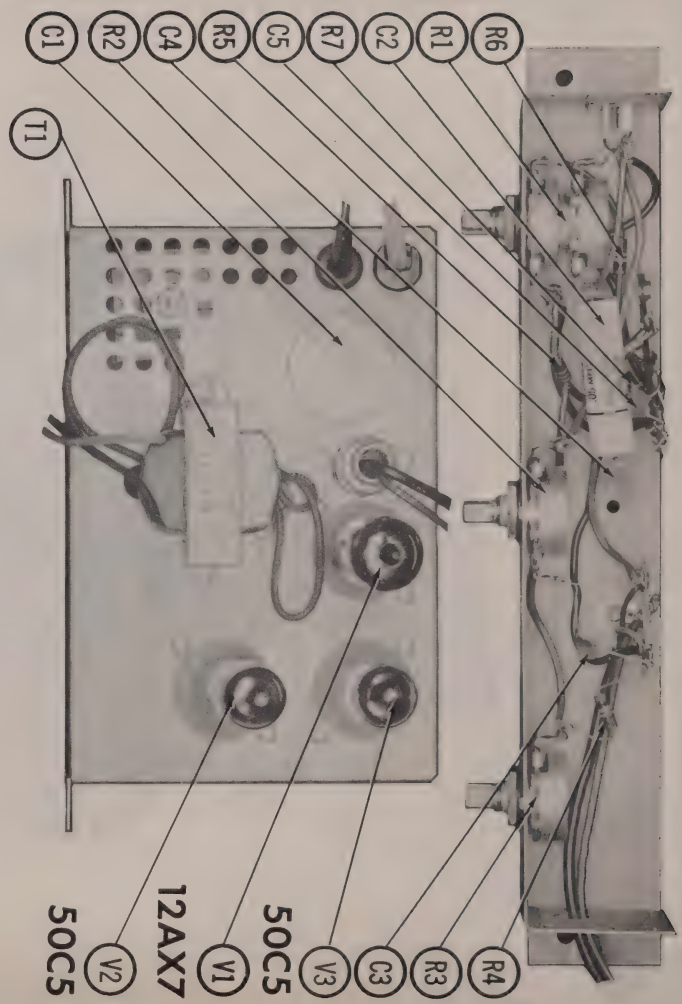
Note 1. Not used in some versions.
Note 2. Model 22S uses .27mfd in this application. Not used in Model 24S.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYMPHONIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3meg *	½	VC-254					Loudness Note 1
B	3meg *	½						(Not used)
R2A	250K	½	VC-160	BT-53	A47F1-250K	Q13-130X		Treble Note 2
	125K Tap							
B	Shaft			Not Req.	KSS-3	Not Req.		
R3A	5meg	½	VC-159	B-88	A47-5meg-Z	Q11-141	U65	Bass Note 3
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Taps @ 1meg and 2meg (2meg Tap not used).
Note 1. Model 22-S uses 5meg (Part #VC-275).
Model 24-S uses 1meg (Part #VC-119).
Note 2. Model 22-S uses 250K (Part #VC-276).
Model 24-S uses 500K (Part #VC-163).
Note 3. Model 22-S uses 3meg with switch (Part #VC-273).
Model 24-S uses 3meg with switch (Part #VC-274).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	(82K) *
R5	33K	
R6	100K	Note 1
R7	1meg	
R8	220K	
R9	330Ω	

ITEM No.	RATING	REMARKS
R10	6.8meg	
R11	220K	
R12	10K	(8200Ω) *
R13	39K	
R14	220K	
R15	100Ω 1W	

ITEM No.	RATING	REMARKS
R16	220K	
R17	220K	
R18	3300Ω	
R19	2200Ω 1W	
R20	47Ω 2W	
R21	47Ω 2W	

* Alternate Value.
Note 1. Not used in some models.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SYMPHONIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3400Ω CT	3-4Ω	TR-102 *					* Part #TR-134 used in Model 22-S. Part #TR-119 used in Model 24S.
		SEC. 2 7Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYMPHONIC PART No.	QUAM PART No.	
SP1 SP2	6" Earphone Theater	PM	3-4Ω	SP-600† SP-201 *	6A31	† Two used in Model 24S * Not used in Model 24S

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SYMPHONIC PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.070A	SR105 *		1N1763 ♦	100A *	SR200 ♦	* Selenium Type ♦ Silicon Type

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

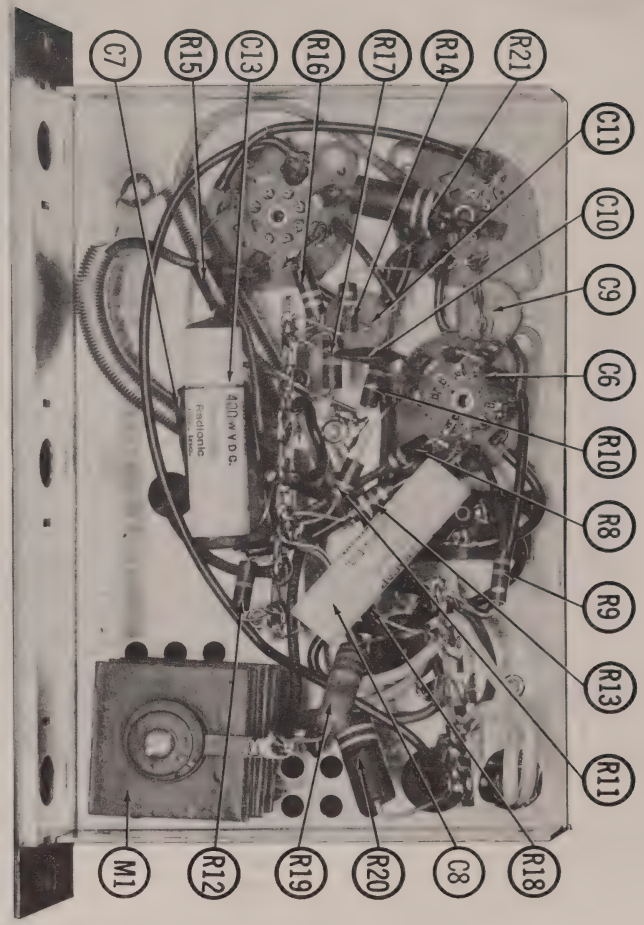
ITEM No.	REPLACEMENT DATA								NOTES
	SYMPHONIC PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			13T	Not Req.	13	Not Req.	10T2-S	Not Req.	

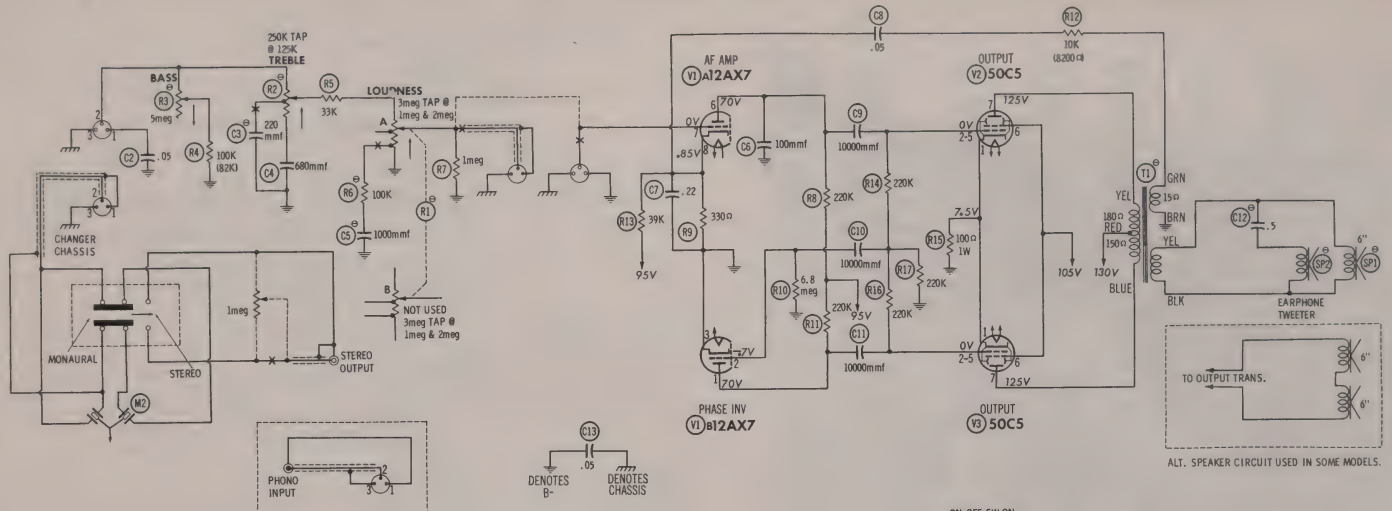
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KN247	Silver; Loudness, Bass, Treble; Models 1522, 22S, 22S (Revised)
Knob	KN248	Gold; Loudness, Bass, Treble; Models 1522, 22S, 22S (Revised)
Knob	KN223	Black With Chrome Insert; Loudness, Bass, Treble; Model 24S
Knob	KN300	Mahogany With Brass Insert; Loudness, Bass, Treble; Model 24S

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†225K	6.8meg	0Ω	15Ω	0Ω	†225K	0Ω	330Ω	NC
V2	50C5	100Ω	NC	75Ω	15Ω	440K	†2200Ω	†180Ω		
V3	50C5	100Ω	NC	175Ω	122Ω	440K	†2200Ω	†150Ω		

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SYMPHONIC
MODELS 22-S, 24-S, 1522

PHOTOFACT® Folder

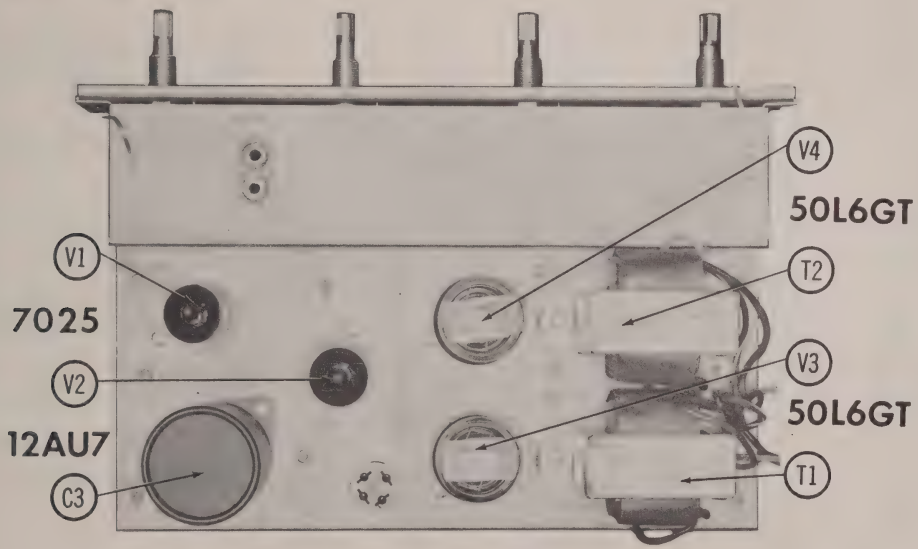
WEBCOR MODELS 1063-1, 1069-1 (Ch. 14X327-1, -2)

WEBCOR MODELS 1063-1, 1069-1 (Ch. 14X327-1, -2)

MODEL EP1063-1

TRADE NAME	Webcor Models BC-1069-1, MC-1069-1, WC-1069-1 (Ch. 14X327-2) EP-1063-1, TP-1063-1 (Ch. 14X327-1)
MANUFACTURER	Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois
TYPE SET	AC Operated 4 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105 - 120 Volts AC, 60 Cycles RATING 52 Watts, .54 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER T184-25 USED IN MODELS 1069 SERIES, E184-13 USED IN MODEL EP-1063-1, OR T184-13 USED IN MODEL TP-1063-1 — SEE WEBCOR 172 — PHOTOFACT SET 447 FOLDER 13 OR RECORD CHANGER MANUAL RC-12



WEBCOR MODELS 1063-1, 1069-1 (Ch. 14X327-1, -2)

SET 511 FOLDER 15

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KT071

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PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	7025/12AX7
V2	Channel 1 AF Amp. - Channel 2 AF Amp.	12AU7
V3	Channel 1 Output	50L6GT
V4	Channel 2 Output	50L6GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	40	250	30P383	PRS1580	BR4025	TC58	TD-40-250	TVA-1511	
C2	30	350	30P382	PRS1660	BR3035	TC77	TD-30-350	TVA-1610	①
C3A	■40	350	30P385	AFH3-39	CO230	FP376.9	TMT-3489	TVL-3688	
B	▲40	350							
C	▲40	350							
C4	100	15	30P384	PRS1200	BBR10015	TC2501	TD-100-15	TVA-1160	①
C5A	100	25NF	30P390		BR10015	TCN425		TVANS-1207.1*	
B	100	25NF			BR10015	TCN425			

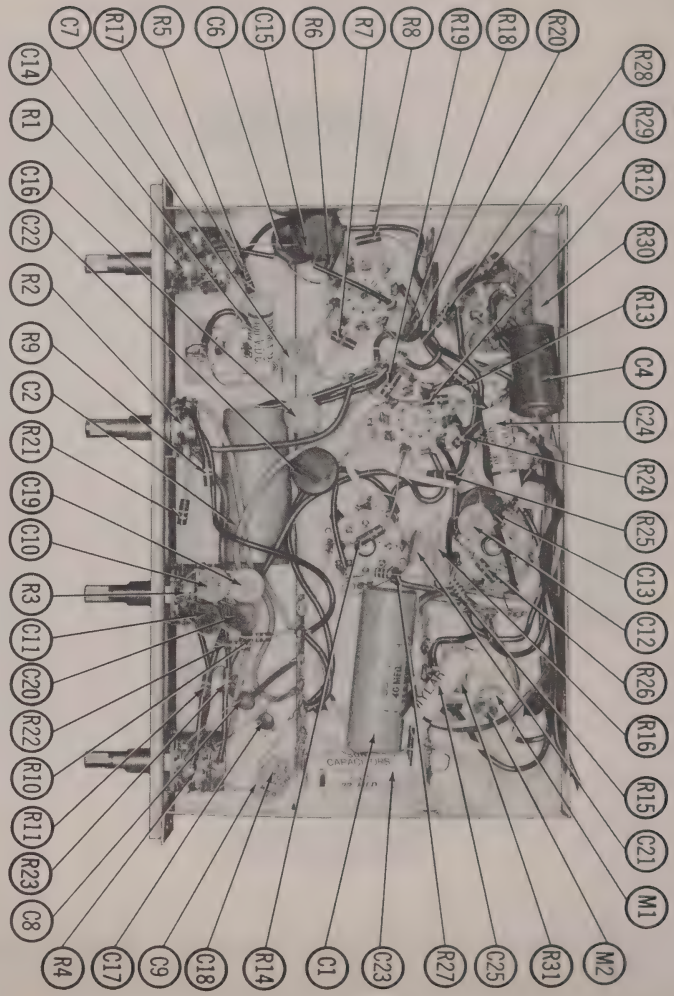
① In early versions, C2 and C4 may be a dual unit (Part #30P408).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	50000		BPD-05	DD-503	CUB2S5	4DP-3-503	GP150	5HK-S50
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	10TS-T33
C9	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215-	10TS-D15
C10	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	50000		BPD-05	DD-503	CUB2S5	4DP-3-503	GP150	5HK-S50
C13	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C14	.04 400V		P488N-04	DD-403	CUB6S4	4DP-3-403	GEM-414	4TM-S40
C15	50000		BPD-05	DD-503	CUB2S5	4DP-3-503	GP150	5HK-S50
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	10TS-T33
C18	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C19	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	50000		BPD-05	DD-503	CUB2S5	4DP-3-503	GP150	5HK-S50
C22	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C23	.22 400V		P488N-22		CUB4 P22	4DP-5-224	GEM-4022	4TM-P22
C24	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C25	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	31P172	B-76				Volume, Channel 1
B	2meg	1/2		SR-76				Volume, Channel 2
C	Bushing			AK-31				
R2A	1meg	1/2	31P170	B-69				Balance
B	Bushing			AK-31				
R3A	1meg	1/2	31P171	B-70				Bass, Channel 1
B	1meg	1/2		SR-70				Bass, Channel 2
C	Bushing			AK-31				
R4A	1meg	1/2	31P171	B-70				Treble, Channel 1
B	1meg	1/2		SR-70				Treble, Channel 2
C	Bushing			AK-31				

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	470K	
R6	3.3meg	
R7	100K	
R8	1200Ω	
R9	120K	
R10	27K	
R11	100K	
R12	100K	
R13	1800Ω	

ITEM No.	RATING	REMARKS
R14	22K	
R15	470K	
R16	95Ω 2W	
R17	470K	
R18	3.3meg	
R19	100K	
R20	1200Ω	
R21	120K	
R22	27K	

ITEM No.	RATING	REMARKS
R23	100K	
R24	100K	
R25	1800Ω	
R26	22K	
R27	470K	
R28	18K	
R29	24K 1W	
R30	250Ω 7W	IRC#PW10-250Ω
R31	25Ω 5W	(10Ω) * IRC#PW5-25Ω

* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	WEBCOR PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4200Ω	6-8Ω	67P085-1①					① Alternate Part #67P085.
		SEC. 2						
		42Ω						
		SEC. 1						
T2	4200Ω	6-8Ω	67P085-1①					
		SEC. 2						
		42Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	QUAM PART No.	
SP1	5"	PM	6-8Ω	76P097 *♦	5A1Z8	* Used in Models 1063 Series.
SP2	6"	PM	6-8Ω	76P102-A *	6A15RZ8	♦ Used in Models 1069 Series.
SP3	5"	PM	6-8Ω	76P097 *♦	5A1Z8	
	10"	PM	12-14Ω	76P098 ♦	10A6AZ12.4	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	WEBCOR PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.110A	65P155		1N1763	F-4	SR200	
M2	.110A	65P155		1N1763	F-4	SR200	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	WEBCOR PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M3	21P586	Not Req.	13T	Not Req.	13	Not Req.	10T2-S	Not Req.	

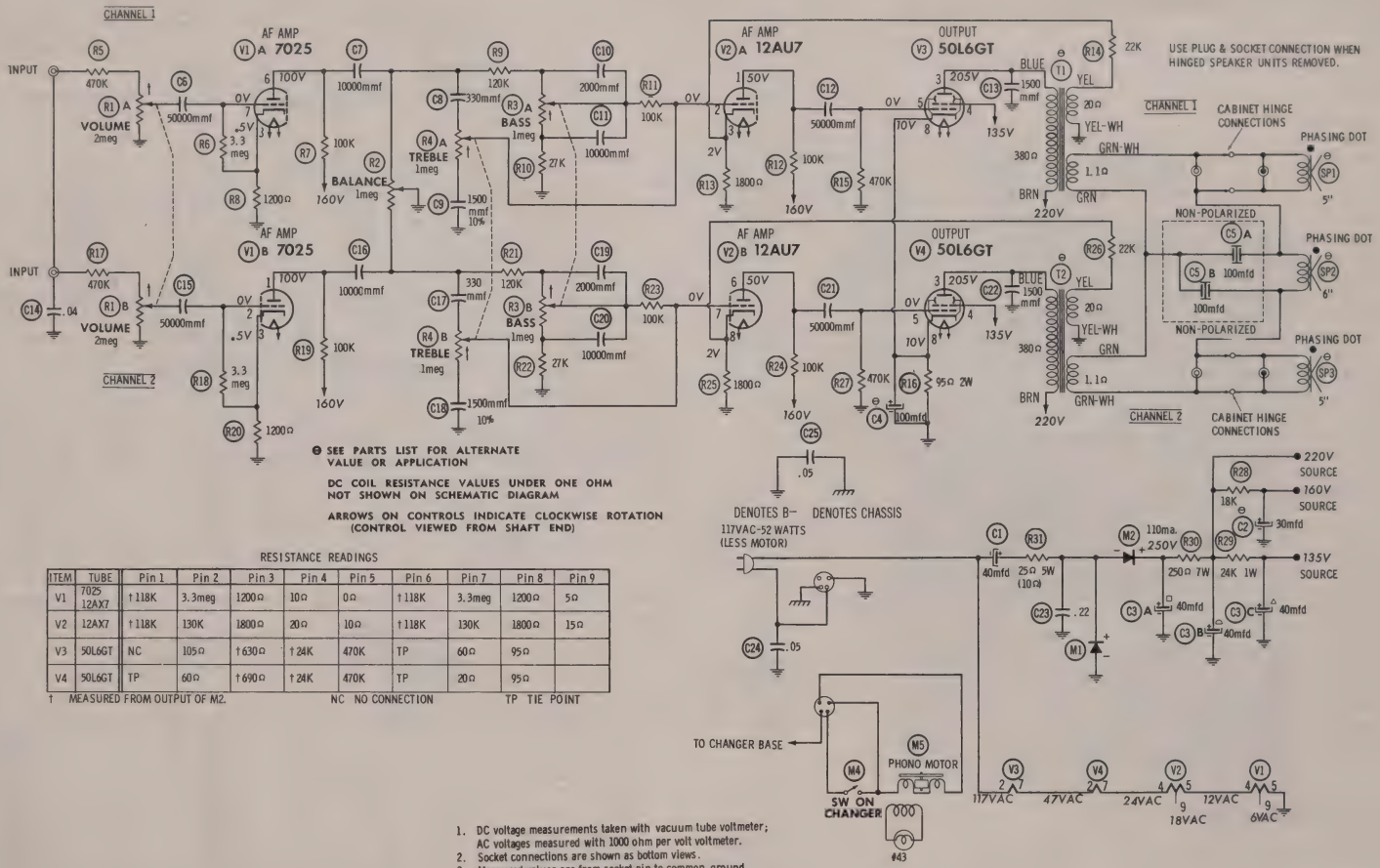
MISCELLANEOUS

ITEM No.	PART NAME	WEBCOR PART No.	NOTES
M4	Switch		Off-On (Part of Changer)
M5	Motor		Drive (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	39P213-7	Volume, Tone, Balance, Model 1069 Series
Knob	39P213-6	Volume, Tone, Balance, Model 1063 Series
Cabinet	92X123-1	Mahogany, Model MC-1069-1
Cabinet	92X123-2	Blonde, Model BC-1069-1
Cabinet	92X123-3	Walnut, Model WC-1069-1
Cabinet	92X121-1	Ebony, Model EP-1063-1
Cabinet	92X121-2	Tan, Model TP-1063-1
Cabinet	11X2328-1	Speaker, Left, Model EP-1063-1
Cabinet	11X2328-2	Speaker, Left, Model TP-1063-1
Cabinet	11X2329-1	Speaker, Right, Model EP-1063-1
Cabinet	11X2329-2	Speaker, Right, Model TP-1063-1
Handle	39P328-2	Cabinet, Brown
Handle	39P328-3	Cabinet, Ebony
Leg	39P244-1	Cabinet, Mahogany, Model MC-1069-1
Leg	39P244-2	Cabinet, Blonde, Model BC-1069-1
Leg	39P244-3	Cabinet, Walnut, Model WC-1069-1



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025 12AX7	†118K	3.3meg	1200Ω	10Ω	0Ω	†118K	3.3meg	1200Ω	5Ω
V2	12AX7	†118K	130K	1800Ω	20Ω	10Ω	†118K	130K	1800Ω	15Ω
V3	50L6GT	NC	105Ω	†630Ω	†24K	470K	TP	60Ω	95Ω	
V4	50L6GT	TP	60Ω	†690Ω	†24K	470K	TP	20Ω	95Ω	

† MEASURED FROM OUTPUT OF M2. NC NO CONNECTION TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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WEBCOR MODELS 1063-1, 1069-1 (Ch. 14X327-1, -2)

PHOTOFACT® Folder

ZENITH MODEL Royal 780
(Ch. 8CT42, 8CT42Z2)

ZENITH MODEL Royal 780
(Ch. 8CT42, 8CT42Z2)

TRADE NAME	Zenith Model Royal 780 (Ch. 8CT42, 8CT42Z2)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Battery Operated Transistorized Portable BC-LW Receiver		
POWER SUPPLY	9 Volts DC	RATING	8MA @ 9 Volts DC (No Signal, Min. Volume) 20MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1600KC	LONG WAVE	150 — 400KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6, A9, A11. GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A7, A8... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A10, A12, A13. GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	(BC) 1600KC	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	600KC	600KC	"	A4	Adjust for maximum output while rocking tuning gang.
3.	"	1600KC	1600KC	"	A5	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	600KC	600KC	"	A6	Adjust for maximum output while rocking tuning gang.
5.	"	1400KC	1400KC	"	A7	Adjust for maximum output. Repeat Steps 4 and 5.
6.	"	"	"	"	A8	Adjust for maximum output.
7.	Place radiating loop near long wave antenna.	165KC	(LW) 165KC	"	A9	Adjust for maximum output while rocking tuning gang.
8.	"	400KC	400KC	"	A10	Adjust for maximum output. Repeat Steps 7 and 8.
9.	"	165KC	165KC	"	A11	Adjust for maximum output while rocking tuning gang.
10.	"	370KC	370KC	"	A12	Adjust for maximum output. Repeat Steps 9 and 10.
11.	"	"	"	"	A13	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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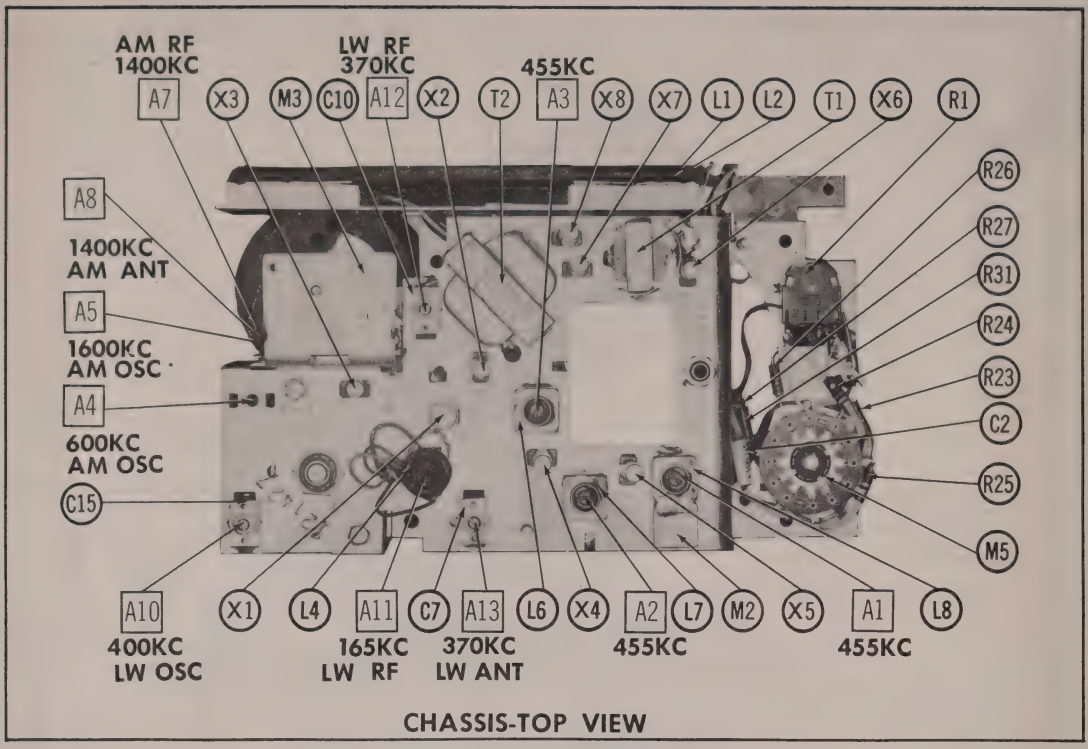
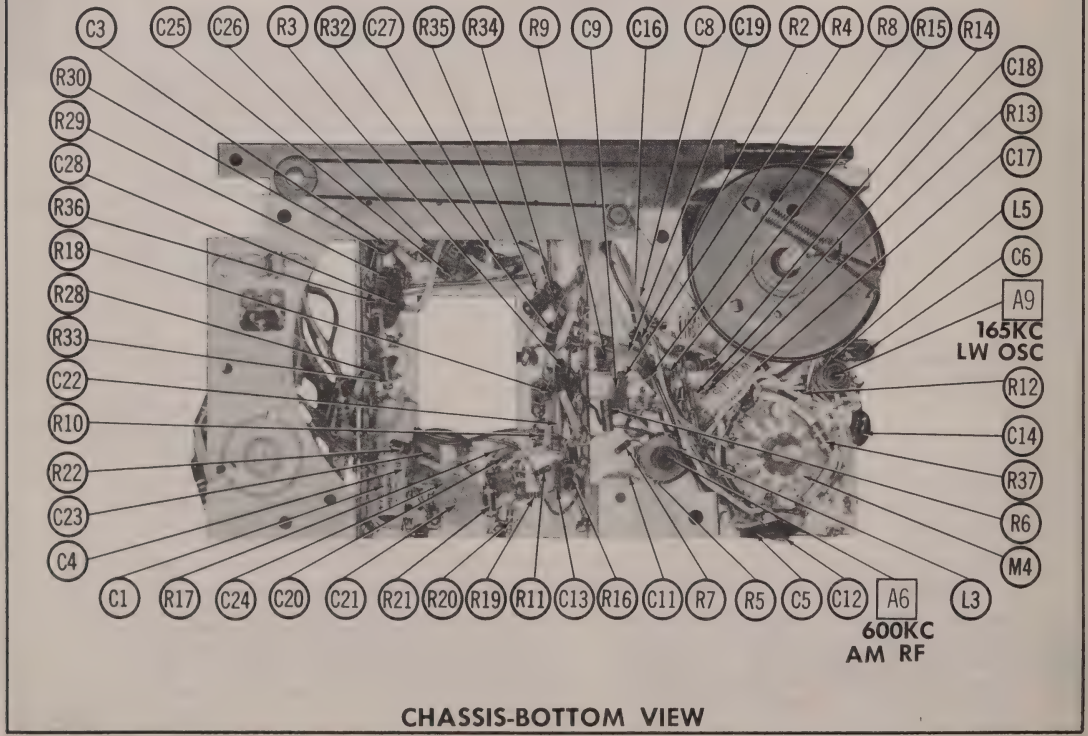
KF140

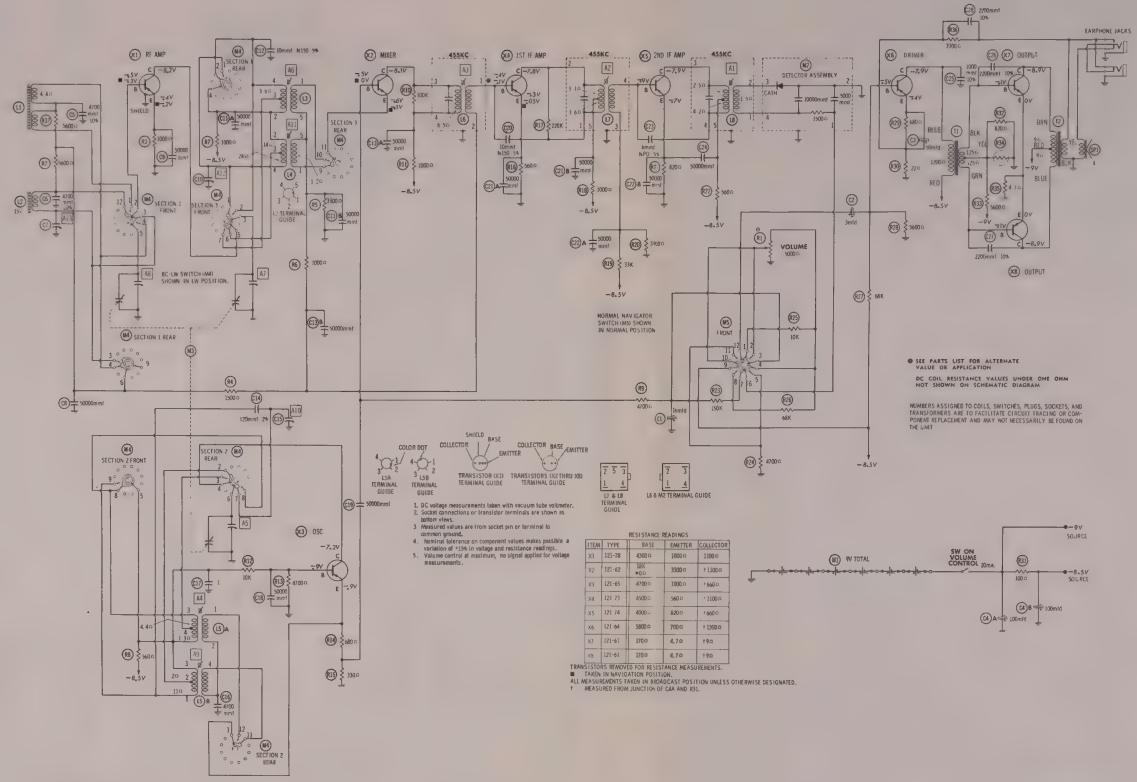
SET 511 FOLDER 16



CHASSIS-TOP VIEW



CHASSIS-BOTTOM VIEW


RF AMP
MIXER
455KC
1ST IF AMP
2ND IF AMP
DETECTOR ASSEMBLY
DRIVER
OUTPUT
EARPHONE JACKS
VOLUME
SECTION 1 FRONT
SECTION 1 REAR
SECTION 2 FRONT
SECTION 2 REAR
SECTION 3 REAR
OSC
BC-LW SWITCH (AM) SHOWN IN LW POSITION.
NORMAL NAVIGATOR SWITCH (AM) SHOWN IN NORMAL POSITION
SHIELD
1 TERMINAL GUIDE
COLOR DOT
LSA TERMINAL GUIDE
LSB TERMINAL GUIDE
COLLECTOR
BASE
EMITTER
SHIELD
TRANSISTOR (CC) TERMINAL GUIDE
TRANSISTORS (GC) THRU X30 TERMINAL GUIDE
L7 & L8 TERMINAL GUIDE
L6 & M2 TERMINAL GUIDE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.
RESISTANCE READINGS
ITEM | TYPE | BASE | EMITTER | COLLECTOR
X1 | 2E1-98 | 4300Ω | 1800Ω | 2300Ω
X2 | 2E1-62 | 4700Ω | 3500Ω | †1200Ω
X3 | 2E1-65 | 4700Ω | 1800Ω | †660Ω
X4 | 2E1-75 | 6500Ω | 560Ω | †1100Ω
X5 | 2T1-14 | 4000Ω | 620Ω | †660Ω
X6 | 2Z1-84 | 5800Ω | 700Ω | †1300Ω
X7 | 2Z1-61 | 370Ω | 4.7Ω | †9Ω
X8 | 2Z1-61 | 370Ω | 4.7Ω | †9Ω
TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
■ TAKEN IN NAVIGATION POSITION.
ALL MEASUREMENTS TAKEN IN BROADCAST POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM JUNCTION OF G4R AND R31.
9V TOTAL
SW ON VOLUME CONTROL
9V SOURCE
8.5V REG. BUS

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ZENITH MODEL Royal 780
(Ch. 8CT42, 8CT42Z2)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR. PART. NO.	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	121-78 *	RF Amp.	2N544		2N370	PNP
	121-101 †	RF Amp.				
X2	121-62 *	Mixer	2N411	2N486	2N141	PNP
	121-103 †	Mixer				
X3	121-65 *	Osc.	2N409	2N485	2N409	PNP
	121-102 †	Osc.				
X4	121-73 *	1st IF Amplifier	2N409	2N483	2N409	PNP
	121-104 †	1st IF Amplifier				
X5	121-74 *	2nd IF Amplifier	2N409	2N483	2N409	PNP
	121-105 †	2nd IF Amplifier				
X6	121-64 *	Driver	2N407	2N362	2N407	PNP
	121-106 †	Driver				
X7	121-61 *	Output	2N407	2N630	2N407	PNP Matched
	121-107 †	Output				
X8	121-61 *	Output	2N407	2N630	2N407	PNP Pair
	121-107 †	Output				

* Used in Chassis 8CT42Z2.
† Used in Chassis 8CT42.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	16	3	22-2871	PWE3015	NLW15-6	TT6X15	ML20-6	TE-1053.5	
C2	3	12	22-2884	PWE25003	NLW5-15	TT12X3	ML4-15	TE-1122	
C3	50	6	22-2726	PWE6050	NLW50-6	TT6X50	ML50-6	TE-1100	
C4A	100	10	22-3062	BCD10X8080	NLW100-12	TT15X100		VLS-2198 *	
B	100	10			NLW100-12	TT15X100			

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	4700 10%		DI-4700		DPMS6D47	CCD-472	JL247	10TS-D47
C6	4700 10%		DI-4700		DPMS6D47	CCD-472	JL247	10TS-D47
C7		#22-3082						
C8	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C10		#22-3082						
C11A	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
B	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C12	10 N150 5%	#22-2731				*		10TCP-Q10
C13A	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
B	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C14	120 2%	#22-3097				VCM-20-121G		
C15		#22-3083						
C16	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C17	.1 50V		P288N-1		WMF1P1E	IDP-2-104	GEM-201	6PS-D47
C18	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C19	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C20	10 N150 5%	#22-2731				*		10TCP-Q10
C21A	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
B	50000		BPD-05	DA-503	H-05S5			TG-S50
C22A	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
B	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C23	6 NPO 5%		NPO-DI 5.0		C10V6C			10TCC-V56
C24	50000		BPD-05	DA-503	H-05S5		TA-150	TG-S50
C25	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C26	2200 10%		DI-2200		DPMSD22	CCD-222	GP222	10TS-D22
C27	2200 10%		DI-2200		DPMSD22	CCD-222	GP222	10TS-D22
C28	2200 10%		DI-2200		DPMSD22	CCD-222	GP222	10TS-D22

\# Zenith Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	63-4645①					Volume & Switch

① Alternate Part #63-4646.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	5600Ω	
R3	1000Ω	
R4	1500Ω	
R5	3300Ω	
R6	1000Ω	
R7	1000Ω	
R8	560Ω	
R9	4700Ω	
R10	100K	
R11	1000Ω	
R12	10K	
R13	4700Ω	

ITEM No.	RATING	REMARKS
R14	680Ω	
R15	330Ω	
R16	560Ω	
R17	220K	
R18	1000Ω	
R19	33K	
R20	3900Ω	
R21	820Ω	
R22	560Ω	
R23	150K	
R24	4700Ω	
R25	10K	

ITEM No.	RATING	REMARKS
R26	68K	
R27	68K	
R28	5600Ω	
R29	680Ω	
R30	22Ω	
R31	100Ω	
R32	820Ω	
R33	5600Ω	
R34	Temp. Comp.	Pt. #63-3663
R35	4.7Ω	
R36	3300Ω	
R37	5600Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ZENITH PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	
L1	BC Loopstick	S-47722	BC-419			
L2	LW Loopstick	S-43956				
L3	BC RF Coil	S-43961				
L4	LW RF Coil	S-43963				
L5A	BC Osc. Coil	S-43965				
B	LW Osc. Coil					
L6	1st IF Trans.	95-1614				
L7	2nd IF Trans.	95-1615				
L8	3rd IF Trans.	95-1616				

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3.5	1	95-1621			TR-13		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ZENITH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	600Ω CT	3-4Ω	95-1619					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-909	4A07	

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	Z7 *		130 *		635 *		M-14R *	* 6 Required

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Detector Ass'y.		Includes Crystal diode (Part #103-22) 5000mmf, 10000mmf, 1500Ω
M3	Tuning Cap.	22-3210	3 Gang, Ant. 15-296mmf, RF. 10-180mmf, Osc. 5-67mmf
M4	Switch	85-637	Band, Rotary Wafer Type
M5	Switch	85-636	AVC, Rotary Wafer Type

CABINETS & CABINET PARTS

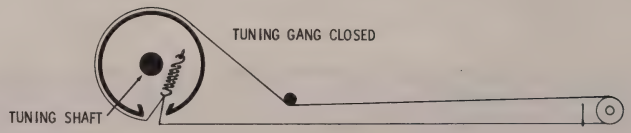
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Scale	26-656	
Dial Pointer	59-356	
Knob	S-47708	Tuning, With Spring Assembly
Knob	S-47709	Volume, With Spring Assembly
Knob	S-47719	Bandswitch And AVC, With Ring Assembly
Cabinet	14-2852	Leather

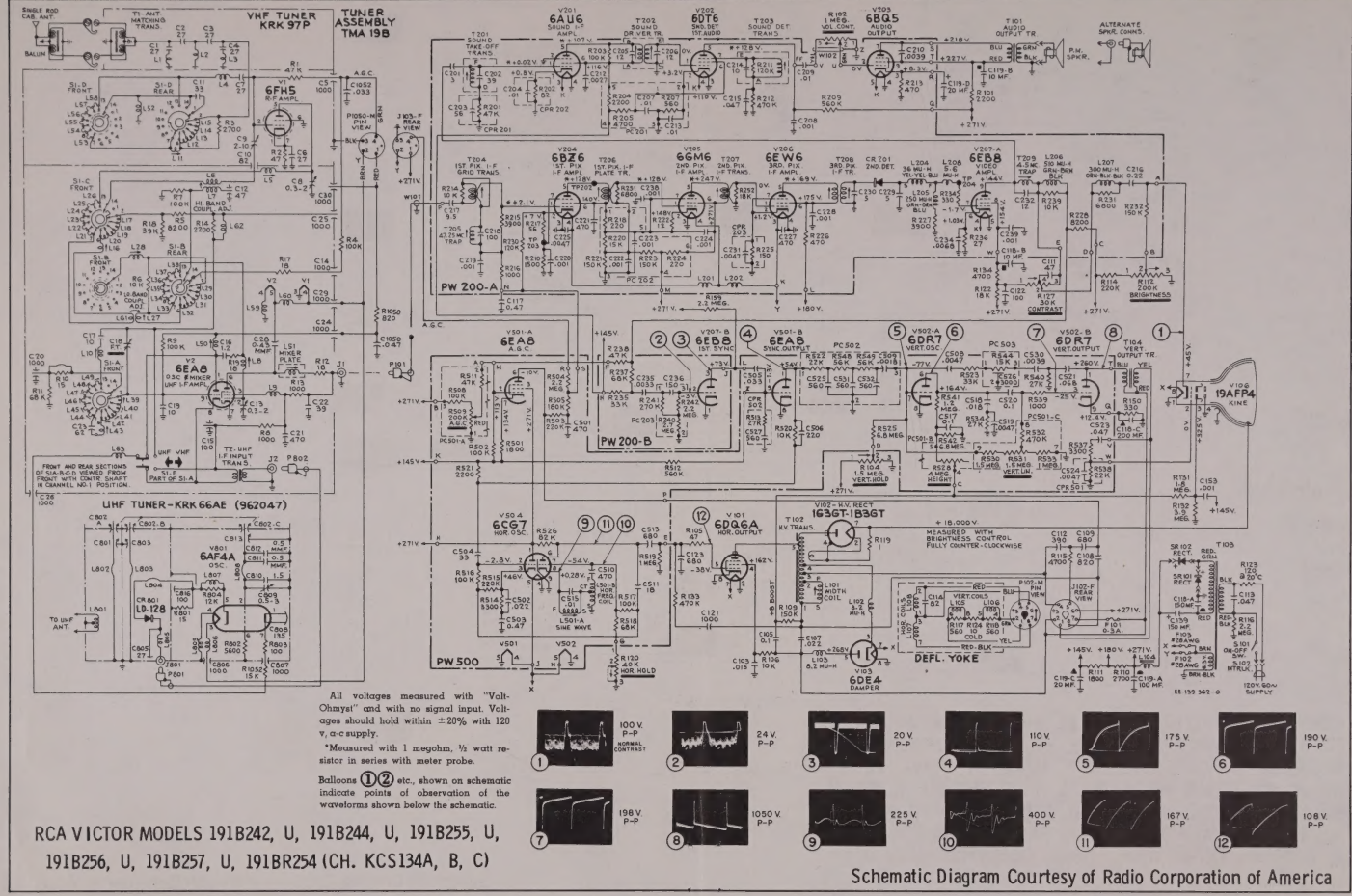
WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

DIAL CORD STRINGING



FRONT VIEW


TUNER ASSEMBLY TMA 19B
VHF TUNER KRK 97P
UHF TUNER-KRK 66AE (962047)
PW 200-A
PW 200-B
PW 500
6AU6
6DT6
6BQ5
6FH5
6BZ6
6GM6
6EW6
6EB8
6EA8
6DR7
6CG7
6DQ6A
6AF4A
6DE4
19AFP4
163GT-183GT
DEFL. YOKE
ALTERNATE SPKR. CONNS.
P.M. SPKR.
BRIGHTNESS
CONTRAST
VERT. LIN.
VERT-HOLD
HOR. HOLD
HOR. OSC.
HOR. OUTPUT
VERT. OSC.
VERT. OUTPUT
SYNC. OUTPUT
1ST SYNC
MIXER PLATE
OSC.
AUDIO OUTPUT TR.
AUDIO AMPL.
VOL. CONT.
SOUND TAKE-OFF TRANS.
SOUND DRIVER TR.
SND. DET. 1ST. AUDIO
SOUND DET. TRANS.
1ST PIX. I-F AMPL.
1ST PIX. I-F PLATE TR.
2ND PIX. I-F AMPL.
2ND PIX. I-F TRANS.
3RD PIX. I-F AMPL.
1ST PIX. I-F GRID TRANS.
2ND DET.
VIDEO AMPL.
4.5-MC TRAP
47-MC TRAP
HI-BAND OSCIL. ADJ.
LO-BAND OSCIL. ADJ.
UHF I.F. INPUT TRANS.
UHF I.F. AMPL.
K.V. TRANS.
WIDTH COIL
BOOST
DAMPER
VERT. COILS
FOCUS
SCREEN
ION-OFF SW.
POWER TRANSF.
SR102 RECT.
SR103 RECT.
T105 POWER TRANSF.
T102 K.V. TRANS.
T103 VERT. OUTPUT TR.
T104 VERT. DRIVER TR.
T101 AUDIO OUTPUT TR.
T201 SOUND TAKE-OFF TRANS.
T202 SOUND DRIVER TR.
T203 SOUND DET. TRANS.
T204 1ST PIX. I-F GRID TRANS.
T205 1ST PIX. I-F PLATE TR.
T206 2ND PIX. I-F TRANS.
T207 2ND PIX. I-F TRANS.
T208 380 PIX. I-F TR.
T209 4.5-MC TRAP
L206 50 MU-H GRN-BLK
L207 300 MU-H GRN-BLK
L204 36 MU-H YEL-BLU
L205 150 MU-H GRN-BLU
L208 47 MU-H YEL-BLU
L209 47 MU-H GRN-BLU
L210 47 MU-H GRN-BLK
L211 47 MU-H BLU-BLK
L101 WIDTH COIL
L102 8.2 MU-H
L103 8.2 MU-H
L104 1.5 MEG. HEIGHT
L105 8.2 MU-H
L501 FREQ. CONTROL
L502 FREQ. CONTROL
L501-A SINE WAVE
CR601 LO-128
CR501 CR502 CR503 CR504
CR201 CR202
CR101 CR102
CR103 CR104
CR105 CR106
CR107 CR108
CR109 CR110
CR111 CR112
CR113 CR114
CR115 CR116
CR117 CR118
CR119 CR120
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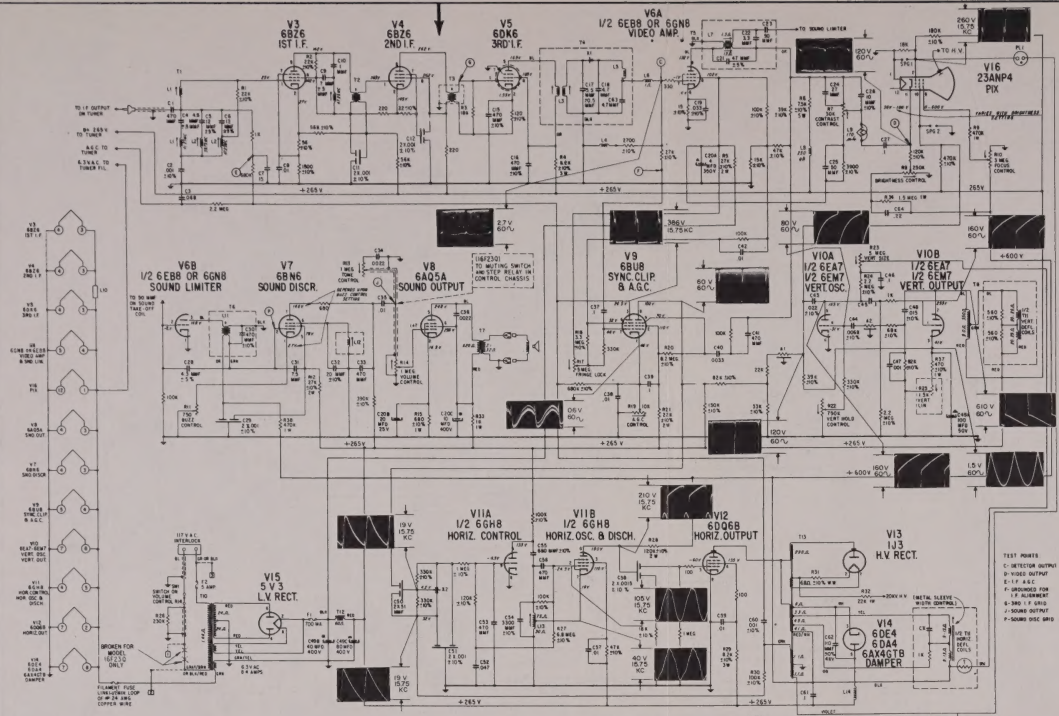
CR135 CR136
CR137 CR138
CR139 CR140

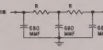

V3 6BZ6 1ST I.F.
V4 6BZ6 2ND I.F.
V5 6DK6 3RD I.F.
V6A 1/2 6EB8 OR 6GN8 VIDEO AMP.
V16 23ANP4 PIX
V6B 1/2 6EB8 OR 6GN8 SOUND LIMITER
V7 6BN6 SOUND DISCR.
V8 6AQ5A SOUND OUTPUT
V9 6BU8 SYNC CLIP. & A.G.C.
V10A 1/2 6EA7 1/2 6EM7 VERT. OSC.
V10B 1/2 6EA7 1/2 6EM7 VERT. OUTPUT
V11A 1/2 6GH8 HORIZ. CONTROL
V11B 1/2 6GH8 HORIZ. OSC. & DISCH.
V12 6DQ6B HORIZ. OUTPUT
V13 1J3 H.V. RECT.
V14 6DE4 6DA4 6AX4GTB DAMPER
V15 5 V 3 L.V. RECT.
PIX TUBE
ALTERNATE BRIGHTNESS CIRCUIT
TEST POINTS
C- DETECTOR OUTPUT
D- VIDEO OUTPUT
E- 1 F AGC
F- GROUNDED FOR I F ALIGNMENT
G- 3RD I F GRID
J- SOUND OUTPUT
P- SOUND DISC GRID
SOCKET AND WIRING FOR 16F230 MODEL
NOTES:
PICTURE TUBE SECOND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC KILOVOLTMETER WITH BRIGHTNESS AND CONTRAST CONTROLS FULL COUNTER CLOCKWISE.

CIRCUIT FUNCTION SPG 1 AND SPG 2 SPARK GAPS

SPG 1 slips over pins 1 and 2 of the picture tube. The gap prevents heater burnout, should an arc occur in the gun. If the picture tube is replaced, install the gap as on the original tube. SPG 2 similarly protects integrator A1.

HORIZONTAL BLANKING CIRCUIT

A negative pulse from the horizontal sweep transformer (violet lead) is applied to grid 1 (pin 2) of the picture tube which cuts off the beam during the horizontal retrace period. The neon bulb acts as a switch which allows the pulse to pass through, but blocks off any transients that may reach the grid during the trace period.



EQUIVALENT CIRCUIT A-1 and A-2 INTEGRATORS

87-4 R is 47K
87-5 R is 33K

ZENITH MODELS F2710Y, YU, F2712E, EU, R, RU, W, WU, F2735E, EU, R, RU, W, WU, F2737E, EU, R, RU, W, WU, F2738E, EU, M; MU, R, RU, W, WU, F2739E, EU, R, RU, W, WU, F2740E, EU, R, RU, W, WU, F2752R, RU, W, WU, Y, YU, F2755H, HU, M, MU, R, RU, W, WU, F2756E, EU, R, RU, W, WU, F2786E, EU, R, RU, W, WU, F3310E, R, W, F3311R, W, Y, F3342R, W, F3348R, W, F3350E, R, W, F3353W, F3354H, M, R, F3359M, F3388W (CH. 16F23, Q, U)

Schematic Diagram Courtesy of Zenith Radio Corporation

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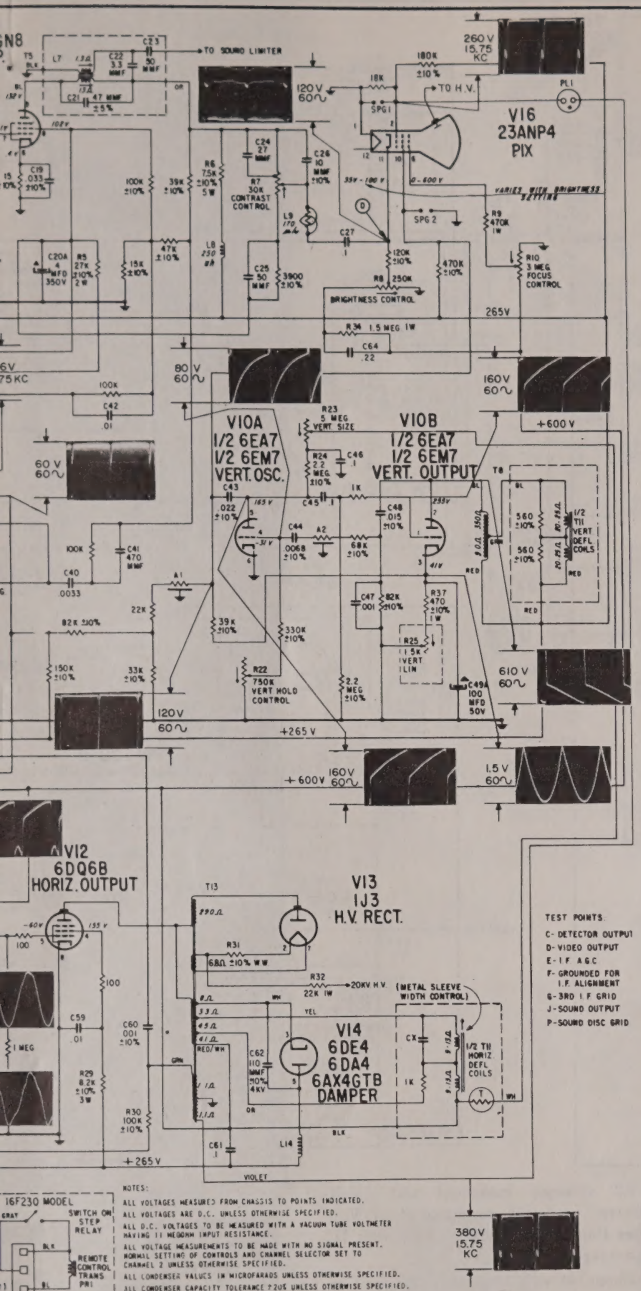
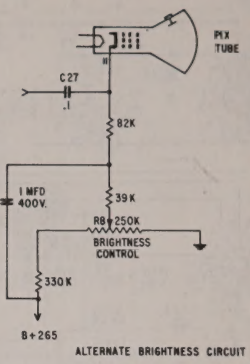




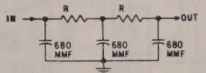
ALTERNATE BRIGHTNESS CIRCUIT

CIRCUIT FUNCTION
SPG 1 AND SPG 2 SPARK GAPS

SPG 1 slips over pins 1 and 2 of the picture tube. The gap prevents heater burnout, should an arc occur in the gun. If the picture tube is replaced, install the gap as on the original tube. SPG 2 similarly protects integrator A1.

HORIZONTAL BLANKING CIRCUIT

A negative pulse from the horizontal sweep transformer (violet lead) is applied to grid 1 (pin 2) of the picture tube which cuts off the beam during the horizontal retrace period. The neon bulb acts as a switch which allows the pulse to pass through, but blocks off any transients that may reach the grid during the trace period.



EQUIVALENT CIRCUIT
A-1 and A-2 INTEGRATORS

87-4 R is 47K
87-5 R is 33K

Schematic Diagram Courtesy of Zenith Radio Corporation